JPRS 75665

9 May 1980

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 43

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EEC REPORTED EAGER FOR SAFEGUARDS PACT WITH AUSTRALIA

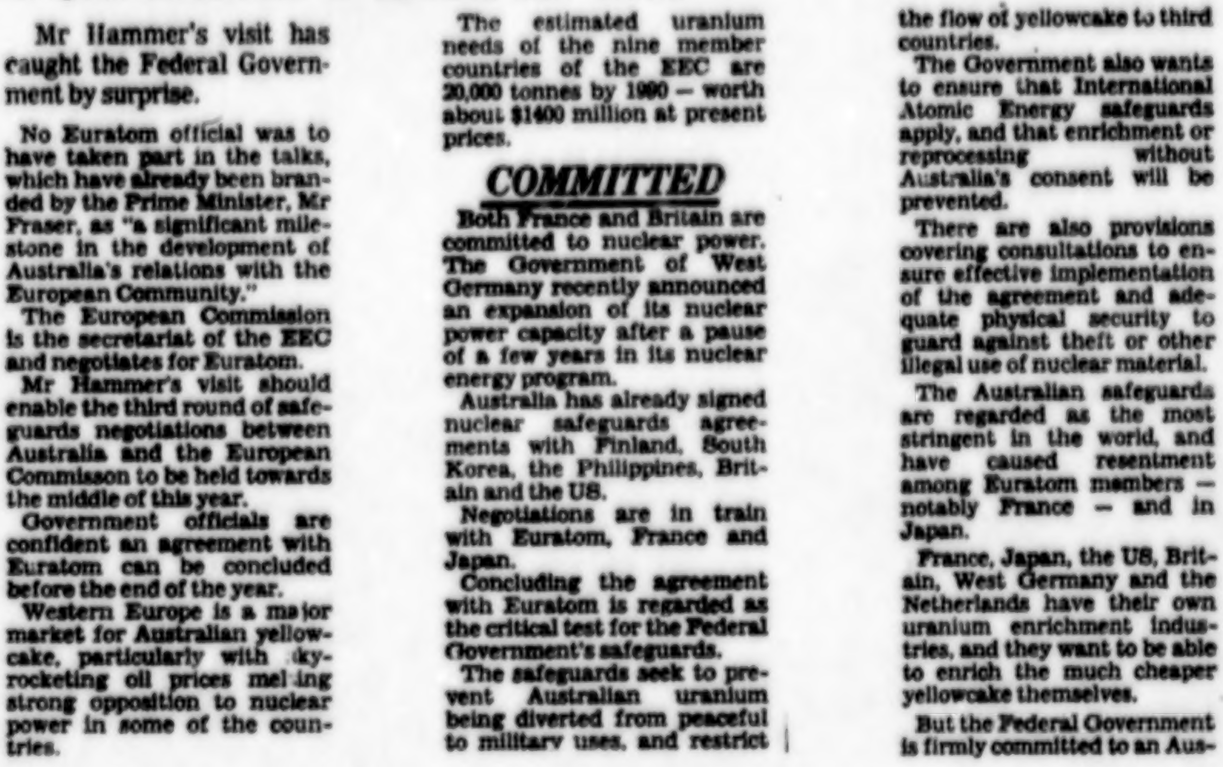
Expert to Canberra

Canberra THE AUSTRALIAN in English 19 Mar 80 p 3

[Report by Wio Joustra]

[Text] The European Economic Community wants to hurry along negotiations with Australia on a nuclear safeguards agreement which will pave the way for huge uranium exports to its nine member countries.

The EEC's atomic energy body, Euratom, will be represented by its safeguards expert, Mr R. Hammer, during a high-level visit by representatives of the European Commission to Canberra next month.



Mr Hammer's visit has caught the Federal Government by surprise.

No Euratom official was to have taken part in the talks, which have already been branded by the Prime Minister, Mr Fraser, as "a significant milestone in the development of Australia's relations with the European Community."

The European Commission is the secretariat of the EEC and negotiates for Euratom.

Mr Hammer's visit should enable the third round of safeguards negotiations between Australia and the European Commisson to be held towards the middle of this year.

Government officials are confident an agreement with Euratom can be concluded before the end of the year.

Western Europe is a major market for Australian yellowcake, particularly with skyrocketing oil prices melting strong opposition to nuclear power in some of the countries.

The estimated uranium needs of the nine member countries of the EEC are 20,000 tonnes by 1990 — worth about $1400 million at present prices.

COMMITTED

Both France and Britain are committed to nuclear power. The Government of West Germany recently announced an expansion of its nuclear power capacity after a pause of a few years in its nuclear energy program.

Australia has already signed nuclear safeguards agreements with Finland, South Korea, the Philippines, Britain and the US.

Negotiations are in train with Euratom, France and Japan.

Concluding the agreement with Euratom is regarded as the critical test for the Federal Government's safeguards.

The safeguards seek to prevent Australian uranium being diverted from peaceful to military uses, and restrict the flow of yellowcake to third countries.

The Government also wants to ensure that International Atomic Energy safeguards apply, and that enrichment or reprocessing without Australia's consent will be prevented.

There are also provisions covering consultations to ensure effective implementation of the agreement and adequate physical security to guard against theft or other illegal use of nuclear material.

The Australian safeguards are regarded as the most stringent in the world, and have caused resentment among Euratom members — notably France — and in Japan.

France, Japan, the US, Britain, West Germany and the Netherlands have their own uranium enrichment industries, and they want to be able to enrich the much cheaper yellowcake themselves.

But the Federal Government is firmly committed to an Australian enrichment industry, and there are no plans to alter the safeguards under pressure from major buyers.

Mr Hammer will have talks in Canberra on April 22 and 23 with officials of the Department of Trade and Resources, the Department of Foreign Affairs, and the Australian Safeguards Office of the Department of National Development and Energy.

Confident of Uranium Supply

Canberra THE AUSTRALIAN in English 31 Mar 80 p 3

[Text]

THE European community's nuclear energy body, Euratom, believes a future Labor Government would honor exisiting uranium supply contracts between Australian producers and European power utilities.

The director-general of Euratom's supply agency, Mr J.B. Mennicken, said in Canberra he was confident of this, no matter which party was in power.

But this assumption is contrary to the ALP's policy on uranium, adopted in 1977. The Opposition spokesman on minerals and energy, Mr Paul Keating, has said on a number of occasions that a Labor government would not feel committed to honor uranium supply contracts made under other governments.

Mr Mennicken said Euratom was convinced that the only way out of the energy crisis was to go nuclear. Its main objective was to secure long-term supplies of yellowcake.

The key to Euratom's policy was diversification and Australia would help to diversify uranium supplies from present sources – Canada and Africa.

The six countries with nuclear power in the community have 60 reactors with a total capacity of 29,000 megawatts or 10.6 per cent of the total electricity needs of the nine members.

Another 30 nuclear stations with capacity of 39,500 megawatts are planned or being built.

CSO: 5100

FOREIGN MINISTER TELLS PARLIAMENT OF NUCLEAR POWER STUDY

Canberra THE AUSTRALIAN in English 20 Mar 80 p 10

[Text] A technical study has concluded that nuclear power can be expected to make an increased contribution to the world's energy needs over the next half-century.

The study, which involved 56 countries, said this development would apply to countries outside the "centrally-planned" economies.

A summary of the major conclusions of the report by the International Nuclear Fuel Cycle Evaluation was presented to Parliament yesterday by the Minister for Foreign Affairs, Mr Peacock.

INCFE was set up at a conference in Washington in October, 1977, after a reassessment by the US Government of the risks of nuclear proliferation.

Its supply and demand comparisons showed that further sources of production were likely to be needed before the end of the century.

The report concluded that, provided that the necessary additional exploration and investment could be made, the industry was likely to meet requirements until the year 2000.

Mr Peacock said the findings vindicated government decisions in 1977 to grant approval to new uranium projects to help meet the needs of an energy-deficient world.

Based on its long-term assessment, the report said that if nuclear capacity growth approached it's high projection, uranium supplies after 2000 might be inadequate.

Substantial deployment of improved thermal and fast breeder reactors would be required to provide assured electricity supplies.

Mr Peacock said adequate supplies of uranium were needed to to allow the widest possible choice among fuel cycle options.

The report said enrichment capacity now operating or under construction would cover projected demand until about 1990. To cover projected demand beyond then, additional capacity would be required.

On the basis of the technologies evaluated, radioactive wastes from any of the fuel cycles examined could be managed and disposed of without undue risk to man or the environment.

The Deputy Leader of the Opposition, Mr Lionel Bowen, said the Government still refused to discuss the central issues of nuclear energy.

He said the Opposition regarded Mr Peacock's statement as inadequate.

"The Government has been using INFCE as an excuse to delay discussion," he said. "A long summary of INFCE is not a substitute for discussion of Australian policy."

CSO: 5100

AUSTRALIA

PHYSICIST PREDICTS MORE N-POWER STATIONS FOR NATION

Canberra THE AUSTRALIAN in English 27 Mar 80 p 3

[Report by Wio Joustra]

[Text] One of the world's leading nuclear physicists, Sir Ernest Titterton, predicted last night that other States would follow Western Australia's example in building a nuclear power station in the 1990s.

Sir Ernest said the Western Australian Premier, Sir Charles Court, had already announced that a site was being sought for a nuclear power plant to provide energy to that State in the 1990s.

"Once built the cheaper power which will then become available will give an enormous fillip to the West Australian economy and it can be expected that other States will then follow rapidly," he said.

In a public lecture at the Australian National University in Canberra, Sir Ernest repeated his claim that nuclear power was the cheapest, safest and most environmentally desirable means of power generation yet devised by man.

He said electricity generated by nuclear power cost 67c a kW/h — half the cost of coal ($1.42) and oil ($1.42).

The safety record of the nuclear industry was "outstandingly good" and far better than that of any comparable industry.

"In recent times there has been an effort to create a myth that something terrible happened at Three Mile Island in the US, but the incident was a seven-day media wonder, with wild and exaggerated claims distributed world-wide."

He said that Three Mile Island was actually a demonstration of the safety of nuclear systems "even under conditions closely approximating sabotage".

Figures produced in Britain showed that for workers in energy industries in England the nuclear industry was safest — 100 times better than offshore oil and 20 times safer than coal.

Sir Ernest said coal-fired power stations were far worse pollutants than nuclear power stations.

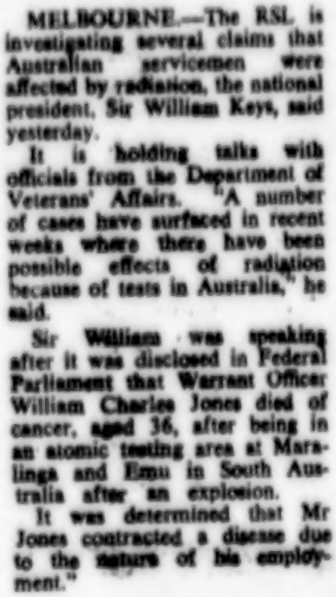
CSO: 5100

PRESS REPORTS FURTHER ON MARALINGA TEST CLAIMS

Servicemen's League Investigates

Sydney THE SYDNEY MORNING HERALD in English 22 Mar 80 p 3

[Text]



MELBOURNE.—The RSL is investigating several claims that Australian servicemen were affected by radiation, the national president, Sir William Keys, said yesterday.

It is holding talks with officials from the Department of Veterans' Affairs. "A number of cases have surfaced in recent weeks where there have been possible effects of radiation because of tests in Australia," he said.

Sir William was speaking after it was disclosed in Federal Parliament that Warrant Officer William Charles Jones died of cancer, aged 36, after being in an atomic testing area at Maralinga and Emu in South Australia after an explosion.

It was determined that Mr Jones contracted a disease due to the nature of his employment."

More Details of Cases

Perth THE WEST AUSTRALIAN in English 27 Mar 80 p 4

[Text] Brisbane: About 100 servicemen had come into contact with contaminated aircraft during the Maralinga atomic bomb tests in 1953 and 1954, a former air force corporal, Mr Ray Donald, said yesterday.

He said that two service widows, Mrs Vera Bradford, of Bribie Island, in Queensland, and Mrs Peggy Jones, of Melbourne, said that their husbands had died of cancer after having taken part in the tests.

Another ex-serviceman, Mr Nick Winn, who was based in the Hiroshima area after the World War, had cancer of the larynx which he believed was the result of exposure to radiation.

Mr Donald, of Ipswich, south-west of Brisbane, overhauled Lincoln planes used at bomb tests at Maralinga in South Australia.

The planes were fitted with canisters and flew through the atomic cloud after the blast to sample dust.

The maintenance men did not wear protective clothing for two days after the blast programme began.

"In those days you weren't worried because no one realised what the danger was," Mr Donald said.

PRECAUTIONS

But some precautions were taken when an English captain tested the planes and the geiger-counter went wild, Mr Donald said.

The same planes were then flown to Amberley where they were quarantined.

Many of the crew took their gear home for their wives to wash.

Mr Pat Greevey, a former army engineer, sparked concern over the effects of radiation during a Returned Services League conference this month.

He said that ex-servicemen who had contracted cancer after possible atomic radiation exposure faced a quasi-legal hitch because they had to prove to a tribunal that their symptoms were the direct result of a recorded incident.

The conference carried a motion from Mr Greevey urging the Federal Government to investigate the possible ill-effects to servicemen exposed to radioactivity in Australia or Japan.

Mr Greevey said last night that several people had since contacted him and there was a move under way to form an atomic veterans' association.

Legal Aid Won

Melbourne THE AGE in English 28 Mar 80 p 4

[Text]

ADELAIDE.— A former RAAF driver yesterday won a 27-year-battle fdr legal assistance to press claims for compensation for illnesses caused by radiation exposure at the Maralinga atomic weapons tests.

Mr. R. D. Johnston, of Birch Street, St. Marys, Sydney, said he considered the Commonwealth Government's decision to grant him legal aid made Australian legal history for ex-servicemen trying to sue the Government.

Mr. Johnstone witnessed four atomic bomb tests at Maralinga, between September 27 and October 22, 1956.

He was attached to a task force of navy, army and RAAF personnel engaged in support work. He said there were about 200 men in the force.

Mr. Johnstone, 46, said he was regarded medically as prematurely aged and was suffering acute anxiety with an overlapping agriphopic syndrome, hypertension, neurodermatitis and an allergic asthmatic condition.

"My clothing consisted of a rayon-type overall, a sort of plastic-type helmet and a breathing filter," he said.

Earlier he said he and his co-driver had been sent to an area not knowing that atomic weapons had been detonated there three years before.

"We had not been warned that it had been a test site and our clothing was simply light service clothing," Mr Johnstone said.

"On returning to my original unit in Sydney in January, 1957, I suffered severe stomach pains, vomiting and diahorrea and I was admitted to No. 3 RAAF hospital, Richmond, with suspected radiation poisoning."

He was told yesterday by the office of his Federal MP, Mr Armitage, his request for legal aid had been granted.

Follow-up Study Urged

Brisbane THE COURIER-MAIL in English 31 Mar 80 p 11

[Text]

CANBERRA. — There was mounting evidence that Australians had contracted cancer after being exposed to radiation while working at British atomic test sites in the 1950s, the Federal Opposition claimed yesterday.

Labor's Urban and Regional Affairs spokesman, Mr Uren, said the Government should immediately begin a follow-up study of Australian policemen, servicemen, and civilians who worked at atomic tests at Maralinga, Emu and Monte Bello in South Australia in the 1950s.

"It should also guarantee to pay fair compensation in all cases where death or disability can reasonably be attributed to radiation exposure resulting from the weapons test," he said.

He said there also were claims which the Government should investigate that some Aboriginals who entered the contaminated Maralinga area during the weapons tests were detained for decontamination.

Mr Uren said that the [illegible] Health Minister, Mr Hunt, stated in 1978 that because of stringent monitoring at the time and due to the fact that Australians were not exposed to dangerous radiation, there would be no follow-up study of the effects on Australians.

"It is clear that the dangers of radiation exposure are greater than was understood at the time of the British weapons tests during the 1950s," Mr Uren said.

"In the United States there is growing evidence that atomic weapons tests have resulted in deaths and ill health among those who worked at the tests and civilians who were subject to radioactive fallout.

"The Government should take note of this new evidence, acknowledge the mistakes of past governments and try to rectify those mistakes."

Warning Signs at Test Sites

Sydney THE SYDNEY MORNING HERALD in English 26 Mar 80 p 15

[Text]

The sites of all nuclear explosions at the Maralinga atomic weapons range in South Australia had now been marked, Parliament was told yesterday.

Areas where radioactivity remained above recommended limits had been signposted and waste burial pits fenced off.

The range was the site of British nuclear weapons test explosions in 1956 and 1957. A series of minor experiments with nuclear materials were also done there between 1956 and 1963.

The Minister of National Development and Energy, Senator Carrick, said a radioactive waste management program had been undertaken in accordance with recommendations made by the Australian Ionising Radiation Advisory Council (AIRAC) in a report tabled in Parliament on May 30, 1979.

The report had concluded that residual radiation at the sites of the nuclear test explosions presented little hazard, and made a number of recommendations on the identification of test sites, fencing of burial areas, capping with concrete of some burial pits and future management of the area.

The recent work was done by the Department of Housing and Construction. Radiation was monitored by the Atomic Energy Commission.

The situation at Maralinga is as follows:

THE SITES of all nuclear explosions and a number of minor test sites have been identified by concrete plinths.

AREAS where radiation levels remain above internationally recommended limits for continuous occupancy have been signposted with multilingual warning signs advising against occupation. Six sites are involved, each a few hundred metres in diameter.

BURIAL pits containing potentially hazardous radioactive material had been capped with heavy concrete slabs and had been enclosed by high cyclone fencing with multilingual warning signs prohibiting access.

Signs warning against removal of any residual materials had been erected near test sites.

FUTURE radiological surveys would be undertaken as recommended by AIRAC.

CONCRETE plinths and warning signs had also been erected at the two former nuclear test sites at Emu, 200 kilometres north of Maralinga. (The Emu range was used by Britain in 1953 but abandoned in favour of Maralinga.)

All main test sites lie within the Woomera prohibited area. Permission to enter Maralinga must be obtained from the Department of National Development and Energy.

CSO: 5100

DEATH ATTRIBUTED TO SECRET ARMY NUCLEAR TEST

Perth THE WEST AUSTRALIAN in English 21 Mar 80 p 13

[Text] Melbourne: A widowed mother of five asserted last night that her husband died from radiation poisoning 13 years after taking part in a top-secret atomic test.

Mrs Peggy Jones, of suburban Clayton, said that her husband was involved in the atomic test in 1953 at Emu Field, north-west of Woomera in South Australia.

Warrant Officer W. Jones died in 1966 from leukemia.

After an eight-year battle for compensation, the army eventually admitted liability in 1974 and agreed to pay $8600, Mrs. Jones said.

She said that at the time of her husband's death a repatriation hospital doctor told her he had died from a very rare disease caused by exposure to radiation.

In the Federal Parliament yesterday, an Opposition front-bencher, Mr T. Uren (Lab., NSW) called on the Government to reopen the case and begin health checks on all Australians involved in the Emu Field test.

He Said that Mrs Jones had been hampered by secrecy in her fight for compensation and the amount eventually paid was miserly and begruding.

Mrs Jones said that her husband was based with the Armoured Corps at Puckapunyal in 1953 when he was selected to go on a secret mission to Emu Field.

"I don't know whether he volunteered or was ordered to go," Mrs Jones said.

She said that WO Jones had been army "through and through" and had kept his oath of secrecy on the mission till his death.

"In the end he didn't get much thanks from the army for keeping the secret," Mrs Jones said.

After her husband's death, Mrs Jones managed to piece together what had taken place.

Group

"He was one of a group who took a tank to the atomic test site so that the army could see how it withstood the blast," she said.

"They took the Centurion by road most of the way and then he drove it to the site.

"After the test he went in to bring it out again.

"But apparently it wouldn't go and he spent two days repairing it on the spot."

Mrs Jones said that her husband first became ill in 1964, 11 years after the incident.

She took the matter to Mr Uren earlier this year because she wanted people to realize what had happened at Emu Field.

"If anyone else involved has died, I would like their families to know the details," she said.

CSO: 5100

MARY KATHLEEN URANIUM PROFITS UP, EXPANSION SOUGHT

Loss by Queensland Mines

Sydney THE SYDNEY MORNING HERALD in English 21 Mar 80 p 17

[Text] Kathleen Investments (Australia) Ltd has lifted its annual dividend after a strong rise in profits last year.

Earnings in the year to December 31 last year jumped 75 per cent to $986,000 compared with $563,000 in 1978.

The directors have declared a final dividend of 2.5c a share, bringing the annual payout to 5c a share compared with 4c in 1978.

The rate of increase in profit outpaced the rate of increase in turnover, which went up 14 per cent from $7.79 million to $8.91 million.

The results released yesterday showed an extraordinary item of $1,399,000, representing the surplus on the sale of Kathleen Investments' 2.6 per cent stake in Mary Kathleen Uranium Ltd last year.

Meanwhile, Queensland Mines Ltd which is mining the Nabarlek uranium deposits in the Northern Territory, sank back into the red last year.

Queensland Mines, which is 50 per cent owned by Kathleen Investments, made a loss of $62,000 compared with a profit of $11,000 in 1978.

The loss was struck on a dramatic rise in turnover which more than trebled to $23.27 million last year compared with $5.27 million in 1978.

A spokesman said the company sold more uranium last year, but because of the established practice under which Queensland Mines draws on the Commonwealth uranium stockpile to fulfil its overseas contracts, it does not get the benefit of any profits derived from such sales.

Investment and other income also jumped a dramatic $3.44 million to $3.8 million last year compared with $367,000.

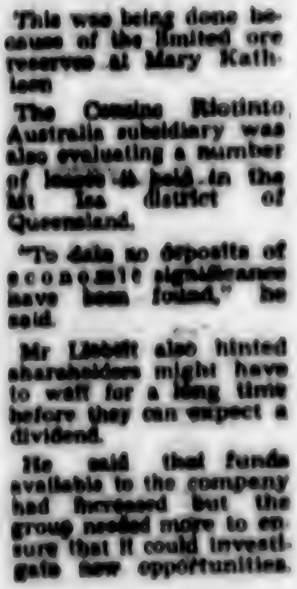
That figure reflected the benefits of putting some of the money from the $75 million loan from Japan announced last year out into the short-term money market.

Increased Exploration

Perth THE WEST AUSTRALIAN in English 31 Mar 80 p 51

[Text] Australia's only uranium exporter is stepping up its search for new ore bodies and new investments in the industry.

In Mary Kathleen Urarium's annual report, the chairman, Mr J. L. Liebelt, said the group was intensifying its investigation of other possible avenues of investment in the uranium industry.



This was being done because of the limited ore reserves at Mary Kathleen.

The Conzinc Riotinto Australia subsidiary was also evaluating a number of leases it held in the Mt Isa district of Queensland.

"To date no deposits of economic significance have been found," he said.

Mr Liebelt also hinted shareholders might have to wait for a long time before they can expect a dividend.

He said that funds available to the company had increased but the group needed more to ensure that it could investigate new opportunities.

CSO: 5100

RANGER URANIUM ADVERTISES FOR QUALIFIED PERSONNEL

Canberra THE WEEKEND AUSTRALIAN 22-23 Mar 80 p 5

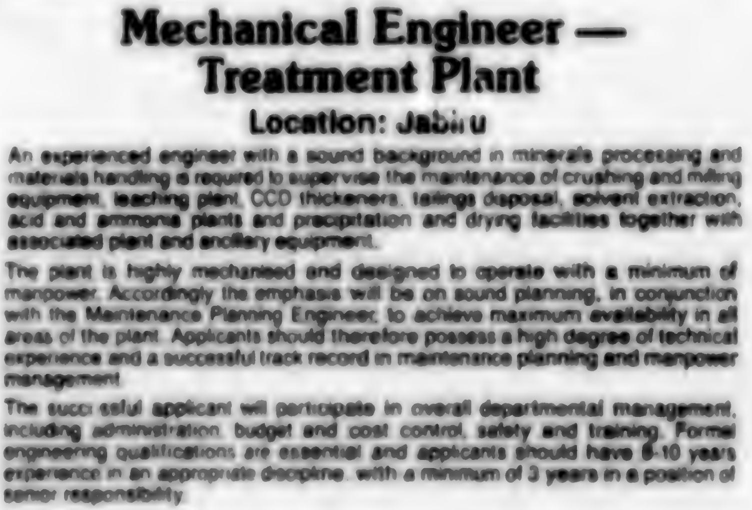
[Advertisement]

[Excerpt] Outstanding opportunities exist for suitably experienced and qualified persons to participate in an important Australian Resource Development Project.

Ranger Uranium Mines Pty. Ltd. will invest in excess of $250 million over the next 18 months in the establishment of its mine and treatment plant at the Ranger Mine Site, some 260 kilometres by sealed highway east of Darwin in the Northern Territory.

To ensure the success of this project, the Company is seeking to engage top flight experienced personnel with a proven ability to perform effectively in their respective capacities.

Construction is well advanced with most major equipment scheduled for installation during the latter part of this year, followed by plant commissioning for commercial operations in mid 1981.



Mechanical Engineer — Treatment Plant

Location: Jabiru

An experienced engineer with a sound background in minerals processing and materials handling is required to supervise the maintenance of crushing and milling equipment, leaching plant, CCD thickeners, tailings disposal, solvent extraction, acid and ammonia plants and precipitation and drying facilities together with associated plant and ancillary equipment.

The plant is highly mechanised and designed to operate with a minimum of manpower. Accordingly the emphasis will be on sound planning, in conjunction with the Maintenance Planning Engineer, to achieve maximum availability in all areas of the plant. Applicants should therefore possess a high degree of technical experience and a successful track record in maintenance planning and manpower management.

The successful applicant will participate in overall departmental management, including administration, budget and cost control, safety and training. Formal engineering qualifications are essential and applicants should have 8-10 years experience in an appropriate discipline, with a minimum of 3 years in a position of senior responsibility.

Maintenance Planning Engineer

Location: Sydney/Jabiru

A mechanical engineer with several years experience in maintenance planning, preferably in mining and/or process industries, is required. This position is responsible for the continued development and efficient control of maintenance procedures in support of engineers responsible for the maintenance of production and services equipment with the object of achieving maximum plant availability.

Liaison with the Supply Department to develop and monitor spares inventories utilising computerised records is an important aspect of the job. The successful applicant will be required to oversee a limited drawing office facility for site engineering needs and maintain a comprehensive system of technical records, data and reports.

Although formal engineering qualifications are desirable, major emphasis will be on proven abilities and appropriate experience.

Power Station Engineer

Location: Jabiru

The Power Station Engineer will be responsible for the efficient operation and maintenance of the 25 MW permanent power station, servicing the entire requirements of the industrial and domestic establishment at the Ranger mine site and Jabiru township covering diesel power generation, waste heat recovery, steam generation and standby process steam plant.

Applicants should possess formal qualifications together with sound experience and a successful track record in diesel power station operations and maintenance preferably in a mining/processing environment.

Power station construction is presently proceeding, with mechanical erection due to commence in May, and final commissioning scheduled for November 1980. Installed equipment will include five pielstick 12PC 2-5V engines and associated ancillaries together with fuel and lube oil supplies, water treatment, fire protection, station ventilation and cooling water systems.

Electrical Engineer

Location: Sydney/Jabiru

An experienced electrical engineer with a sound background in power generation and distribution and industrial plant maintenance is required. The Electrical Engineer will direct electrical maintenance over a broad spectrum of activities including power generation, 22KV/11KV power distribution, underground reticulation, electrical services for crushing and treatment plant — including process control and instrumentation — computerised and electronic systems, mobile and VHF radio and specialised laboratory testing and monitoring equipment.

The successful applicant will participate in departmental management activities including administration, budget and cost control and safety and training. Before taking up duties at Jabiru, he will be required to spend a brief period in Sydney assisting in co-ordinating outstanding Power Station design work.

Formal engineering qualifications are essential, together with 8-10 years experience, including a minimum of 3 years of senior responsibilities.

Mine Shift Supervisor

Location: Jabiru

The Mine Shift Supervisor will be responsible to the Mine Foreman, on a shift basis, for the routine direction and deployment of personnel and equipment in the mine pit in accordance with agreed production plans, established mine routines and high standards of safety.

Mining will be done by conventional open-cut methods using front-end-loaders and trucks. Total mine production will be at the rate of 3 million tonnes per annum.

Initially mining will be undertaken by contractors and the Shift Supervisor's duties will be concerned mainly with grade control.

Applicants must have previous experience in open-cut mining or quarrying operations and should possess appropriate supervisory skills.

Discriminator Operator (Grade Controller)

Location: Jabiru

A modern, computerised ore grade detection system will be used to ensure accurate grade control. Ore trucks will be passed through a discriminator and will be directed to stockpile according to grade and material type.

The Discriminator Operator will be responsible to the Mine Foreman, on a shift basis, for the operation of the ore grade discriminator and the proper direction of all material removed from the mine. Other duties include the maintenance of appropriate records and preparation of reports and statistics as required.

Previous experience in grade control in an open-cut mining situation or in the operation of automated or computerised production control systems is desirable, and applicants must possess the ability to maintain accurate and neat records and to liaise closely with production foremen and supervisors.

Senior Chemist

Location: Sydney/Jabiru

The Senior Chemist will be responsible to the Mill Superintendent for the provision of effective and comprehensive site analytical services.

Initial involvement will be with the evaluation and selection of equipment for the chemical laboratory which is planned to be ready for use towards the end of the year. Other duties will include the formulation and documentation of procedures and the selection and training of staff.

Applicants should possess a degree in Chemistry and must have at least five years experience, preferably in the mining industry. A sound working knowledge of instrument analytical techniques is essential.

The appointee will be required to spend about 3 to 4 months in Sydney where subsidised accommodation will be provided.

Junior Chemist (Environmental)

Location: Jabiru

The Company's $1 million environmental laboratory is being commissioned to monitor and research the impact of the uranium mining project on the local environment. Analysis of water, soil, biota and air will be required for a range of elements, especially trace heavy metals and radionuclides of the uranium decay series.

The air conditioned laboratory is equipped with the latest instrumentation including flame and carbon rod atomising atomic absorption spectrophotometers, ion exchange chromatograph, UV-visible recording spectrophotometer, alpha and gamma spectrometers and a range of minor instruments.

The Junior Chemist will be responsible to the Environmental Chemist and duties will include assisting in the setting up of the laboratory, assisting in the development and adaptation of standard methods and the collection and preparation of environmental samples. This is a first class opportunity for a recent graduate in chemistry to obtain valuable experience in a developing area of environmental science.

Salaries will be negotiated to reflect qualifications, experience, achievement and the level of the appointment within the Ranger Organisation. Benefits include 5% contributory superannuation scheme and on-site furnished accommodation. Reasonable costs of relocation will be met by the Company. Zone A taxation concession applies.

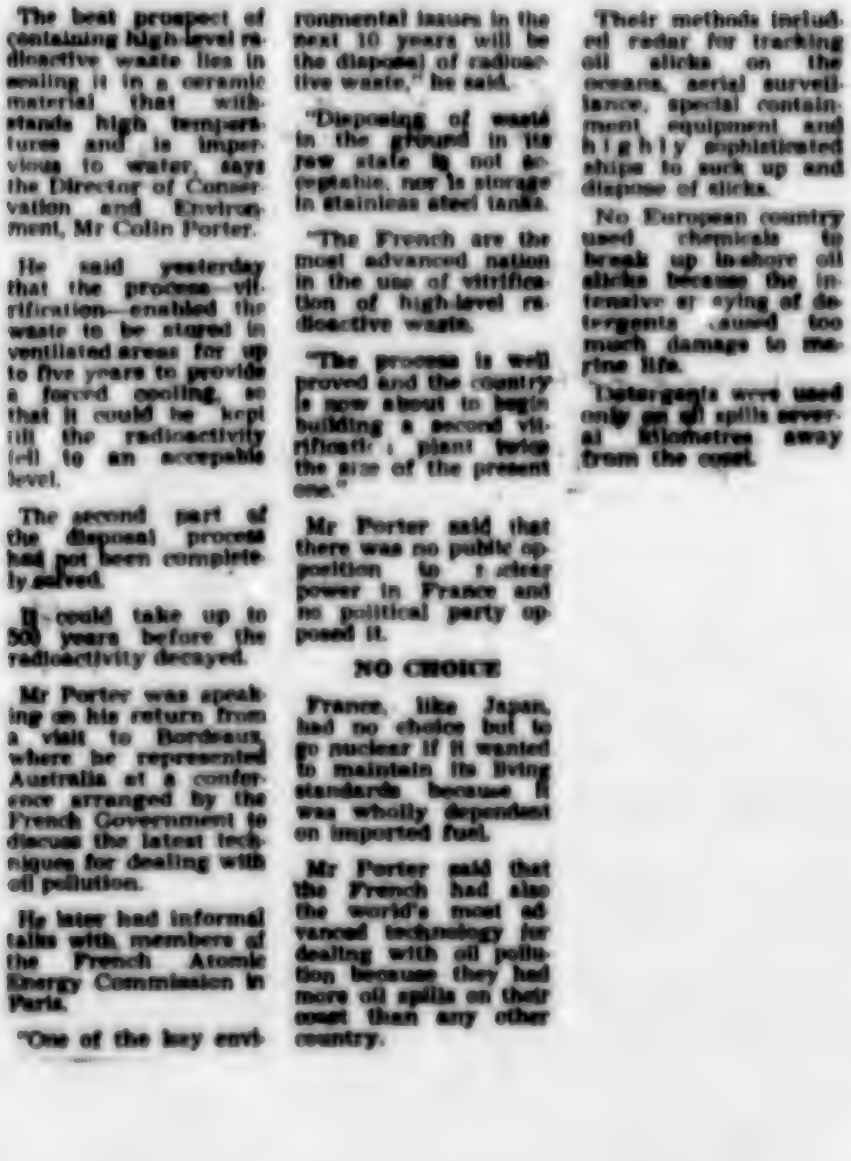
CSO: 5100

AUSTRALIA

CERAMIC CONTAINERS FOR NUCLEAR WASTE RECOMMENDED

Perth THE WEST AUSTRALIAN in English 18 Mar 80 p 26

[Text]



The best prospect of containing high-level radioactive waste lies in sealing it in a ceramic material that withstands high temperatures and is impervious to water, says the Director of Conservation and Environment, Mr Colin Porter.

He said yesterday that the process—vitrification—enabled the waste to be stored in ventilated areas for up to five years to provide a forced cooling, so that it could be kept till the radioactivity fell to an accepable level.

The second part of the disposal process had not been completely solved.

It could take up to 500 years before the radioactivity decayed.

Mr Porter was speaking on his return from a visit to Bordeaux, where he represented Australia at a conference arranged by the French Government to discuss the latest techniques for dealing with oil pollution.

He later had informal talks with members of the French Atomic Energy Commission in Paris.

"One of the key environmental issues in the next 10 years will be the disposal of radioactive waste," he said.

"Disposing of waste in the ground in its raw state is not acceptable, nor is storage in stainless steel tanks.

"The French are the most advanced nation in the use of vitrification of high-level radioactive waste.

"The process is well proved and the country is now about to begin building a second vitrification plant twice the size of the present one."

Mr Porter said that there was no public opposition to nuclear power in France and no political party opposed it.

NO CHOICE

France, like Japan, had no choice but to go nuclear if it wanted to maintain its living standards because it was wholly dependent on imported fuel.

Mr Porter said that the French had also the world's most advanced technology for dealing with oil pollution because they had more oil spills on their coast than any other country.

Their methods included radar for tracking oil slicks on the oceans, aerial surveillance, special containment equipment and highly sophisticated ships to suck up and dispose of slicks.

No European country used chemicals to break up in-shore oil slicks because the intensive spraying of detergents caused too much damage to marine life.

Detergents were used only on oil spills several kilometres away from the coast.

CSO: 5100

BRIEFS

RADIATION LEVELS DISCUSSED--Adelaide.--Safety levels for exposure to radiation were 10 times too high, a prominent South Australian research scientist said yesterday. Dr J. D. Potter, a research fellow in epidemiology and Doctors' Reform Society president said this had been shown in evidence from recent studies on the effects of low-level radiation. He was given evidence to the South Australian Legislative Council select committee on uranium resources. Dr Potter said that while the evidence was controversial and had been criticised on statistical grounds, an increasing number of scientists were supporting it. The 1971 report of the International Committee on Radiological Protection said the ratio of cancer effects to genetic effects after a given exposure of radiation was 60 times greater than was thought 15 years ago. [Excerpts] [Brisbane THE COURIER-MAIL in English 1 Mar 80 p 10]

CSO: 5100

ATOMIC ENERGY COMMISSION CHAIRMAN ON NUCLEAR PROGRESS

Dacca THE BANGLADESH OBSERVER in English 26 Mar 80, Supp, p 2

[Article by Dr Anwar Hossain, chairman, Bangladesh Atomic Energy Commission: "Atom for Peace in Bangladesh"]

[Text] It is often said that a poor country like Bangladesh cannot afford to spend large sums of money on atomic energy research. This no doubt is a misconception. In this age there is no escape from using nuclear research techniques to solve some of our urgent problems in agriculture, medicine, industry and hydrology. Nuclear techniques are not necessarily more expensive than the conventional methods since the results could be faster and more accurate. The end application is, of course, conventional. Secondly, atomic research leaders to the development of modern technology, especially electronics and computer science, which is a must for achieving self-reliance in research and economic development.

To illustrate the point let me briefly state some of the activities of the Bangladesh Atomic Energy Commission in the fields of biological sciences, physical sciences and nuclear power.

Agriculture: The Institute of Nuclear Agriculture set up by BAEC of the Agricultural University in Mymensing is employing nuclear techniques to evolve better varieties of food and cash crops, optimum application of fertiliser and more effective pest control. By radiation mutation process, which is faster than conventional plant breeding, we have developed new varieties of rice, jute, pulses and other crops. Some of them have been approved by the National Seed Board for release to the farmers. Radioisotope tracer technique has been employed to determine the correct ratio of fertiliser components and a method of their application for optimum yield of crops. Deficiencies in soil, especially the micronutrients, can be detected by nuclear techniques. Research is in progress to determine soil quality and proper irrigation and drainage requirement in agriculture. Insect behaviour is also under study to introduce what is known as "sterile technique" to eliminate certain pests.

Medicine: The first atomic energy medical centre was set up at Dacca Medical College Hospital in 1959. After Independence, two such centres have been set up in Chittagong and Rajashahi and two more are under construction in Svlhet and Dinajpur. In collaboration with the Health Ministry BAEC plans to set up such centres in all the Medical Colleges and also in some general hospitals in the country.

At these centres radioisotopes are used in the diagnosis of [word illegible] diseases and disorders of thyroid, liver, kidney spleen etc., detection of anaemia and malnutrition, and treatment of some of the diseases e.g. disorder of the thyroid gland. More than 50,000 patients have been attended to since 1972 and 5,000 of them have been treated.

In addition to routine clinical applications of radioisotopes, a number of research projects have been undertaken. A Research Institute of Nuclear Medicine is now being set up.

Food Preservation and Medical Sterilisation: The penetrating power of gamma radiation has been utilised in preventing food losses and for sterilisation of medical supplies including surgical and family planning kits. Methods have been developed for off-season preservation of potatoes and onions and disinfestation of stored foodgrains. Dried fish made insect-free by irrigation can be stored in polythene packages for about 12 months. Shelf life of fresh fish has also been extended. All these results are now being tested in pilot plants with simultaneous cost-economics and health studies before application on commercial basis. Already about 20,000 vasectomy kits and 100,000 I.V. transfusion sets have been sterilised and used in family planning and rural health programmes.

An Irradiation and Pest Control Research Institute has just been completed at Sayar for research, development and pilot plant work in food and biology.

Health Physics: The health physics division at the Atomic Energy Centre in Dacca is responsible for radiation protection services throughout the country. A regular environmental monitoring work is in progress to determine the level of radioactivity in air, water, soil and some food samples. People are being trained for other institutions for radiation monitoring.

Electronics: The electronics division of the centre has designed and fabricated a number of electronics equipment in addition to providing repair and maintenance services to all BAEC establishments and many outside educational and research organizations. A market survey has just been made for production of electronic equipment in Bangladesh. An Institute of electronics is now under construction at Sayar.

Analytical Chemistry: Chemical procedures have been developed for the analysis of low-grade uranium ores and for sereration and estimation of uranium. A number of analytical techniques such as X-ray fluorescence, fluorometry, spectrophotometry, gas chromatography have been developed for analysis of very small quantity of elements in ores, agricultural products, etc and for pollution studies in samples of water.

Technical Physics: For the first time magnets and ferrite materials have been produced in laboratory scale. Work on improvement and standardisation is in progress. Some work has been done on high vacuum techniques and preparation of samples of thin films. Liquid air and nitrogen are being produced regularly for routine laboratory work.

Computer Science: BAEC has pioneered the introduction and use of digital computers in the country and organised a number of training courses in computer programming. BAEC has just ordered an IBM 4341 fast computer for advanced scientific work in reactor technology, electronics, theoretical physics and space application programmes.

Isotope Application in Industry & Hydrology: X-ray radiography techniques have been developed to find defects in welding, pipeline joints, boilers, etc. Such services are being provided to Chittagong Steel Mills, Eastern Refinery, Titas Gas Company and some other institutions.

Isotope techniques have been developed for measuring velocity and direction of ground water in a laboratory scale. This will be extended to field work in collaboration with the Water Development Board to study dynamics of underground water.

Survey of Heavy Minerals: Exploration work in the beach sand along the coastal area has resulted in the discovery of commercial deposits of more than 5 million tons of heavy sand out of which rutile and zircon should find export market. A pilot plant has been set up in Cox's Bazaar and a scheme has been submitted to the Government for commercial exploitation of the minerals found in Moheshkhali sand.

Survey work in Sylhet and Chittagong has revealed the presence of uranium and thorium sandstone deposits and test drilling has commenced.

Research Reactor: A 3MW research reactor has now been ordered and it is expected to be in operation in about 3 years. In this meantime, laboratories will be built for production radio isotopes from the reactor and to conduct nuclear technological research.

Nuclear Power: Feasibility studies for introducing nuclear power as an alternative source of electricity in the country has been going on for the last 20 years. An entry in nuclear power technology is essential before the doors are closed to us both from the point of view of reluctance of developed countries to transfer such technology and the prohibitive initial cost due to stringent safety precautions. A larger-sized nuclear power station is more economical but this cannot be integrated in our national grid at present. If soft loan can be secured a 125 MW nuclear power station can be set up at Rooppur, followed by a large station (say 600 MW) in the nineties. Once a nuclear power station is commissioned there will be a large savings in fuel cost every year. At present we are spending over 50 crore takas in fuel annually to produce 125 MW of electric power.

Due to the present crisis of conventional fuel both in terms of availability and rice alternative sources of power are being explored all over the world. Nuclear power is the foremost of them as a proven source.

CSO: 5100

INDIA

NUCLEAR STATION COMMISSIONING DELAYED BY ACCIDENT

Calcutta THE STATESMAN in English 26 Mar 80 p 16

[Text] NEW DELHI, March 25.—The re-commissioning of unit I of the Tarapur nuclear station has been delayed because of an accident in its primary coolant system, official sources said yesterday, reports PTI.

The accident which occurred at 8 a.m. on March 14 resulted in the gushing out of radioactive water into the reactor building.

It happened when attempts were made to repair the cracks in the six-inch bypass line of the primary coolant tube which carries the hot radioactive water from the reactor core.

As a result of the accident, contaminated water drained from the open-ended bypass line into the reactor building from where it was pumped out.

Officials said that the area has now been thoroughly tested and was found to be free of any contamination.

The mishap took place when attempts were made to weld a new piece of pipe to replace a two-foot length of the pipe that had developed cracks.

To do this a small section of the pipeline on the upstream of the cracks was frozen with liquid nitrogen. This turned the (radioactive) water inside that section into an "ice plug" stopping the flow of water while the bad pipe was sawed off.

This was a standard procedure whenever a crack had to be welded. But the "ice plug" did not remain intact and was pushed out by the gushing water after the bad pipe was cut and before the new pipe was welded.

A temporary plug was then somehow pushed inside the six-inch open pipe and it was being held in position by chains. This could not, however, stop the leaking water completely.

As water gushed out of the ruptured iceplug, the level of water in the reactor core started to fall but was corrected by running the feedwater pumps.

Although the reactor was not running at the time of the accident, proper water level in the core had to be maintained to avoid overheating of the fuel rods.

Press reports earlier this month about leaks in the Tarapur unit had been dismissed by atomic energy officials as "pin hole" size — too small to be able to cause any radiation incident.

CSO: 5100

REPORTER DESCRIBES FUKUSHIMA NUCLEAR POWER PLANT

Brisbane THE COURIER-MAIL in English 20 Mar 80 p 5

[Third of a series of articles on the energy crisis: "Japan: N-Waste into the Ocean", by Jack Lunn]

[Text]

It is bitterly cold. The wind whips across the Pacific Ocean and cuts like ice-knives.

Into this ocean a cascade of water pours at the rate of 150 tonnes an hour.

We are on a breakwater that juts into the ocean and the torrent we are watching is ejected from the world's biggest nuclear operation.

The man with me is Mr. Seiichi Saitoh, a public relations man from the Tokyo Electric Power Co. Inc., which owns the station.

Through an interpreter, Mr Saitoh says that measured radioactivity results of sea water and sea bed sand at the cooling water discharge outlet showed no difference before and after plant operation.

* * *

He adds that no effect was observed in fish caught in the area.

The breakwater provides one of the best views of this monster power plant.

There are six nuclear reactors, each in its own 70 metre high thick concrete box.

It dwarfs the world's best known nuclear plant, the Three Mile Island operation in Pennsylvania which had two reactors when I visited there two years ago.

Unlike Three Mile Island the workers here don't seem to feel that the world is against them, and security is in the downbeat Japanese style.

At the entrance to the grounds we drive through, Mr Saitoh gives the guard a casual wave.

Another guard nods as we enter the building complex (at the United States project I was body-searched) and after a corridor-walk a control-room supervisor welcomes us with a "please to enter."

In passable English he takes me around the room, explaining emergency lights, locks and levers, and says 11 men are needed to operate this nerve centre.

Down a corridor men are being checked for radioactivity levels. "Just a precaution", says Mr. Saitoh.

Through an interpreter, he says that by any measure this is the world's biggest nuclear power operation.

The plant is on the east coast in Fukushima Prefecture, a four-hour train ride north of Tokyo, and the first reactor was commissioned in 1971.

The other five reactors came on stream at intervals with the last one starting on October 24 last year.

It turns out 4700 megawatts, uses 150 tonnes of uranium a year, and cost $1.92 billion.

I query these figures three times, but an exasperated Mr. Saitoh stays with them.

About 4000 people work there, and it provides just about all the domestic power used in Tokyo, the world's largest city.

Tourists who traipse the bright lights of the Ginza and Roppongi might be amazed to know that the blaze of neon around them finds its source in the world's biggest nuclear plant. And it won't stop there.

A 20 minute drive south of Fukushima No. 1 reveals another big nuclear plant well under way.

Mr. M. Ogino, superintendent of Fukushima Daini atomic power station construction office, says the Tokyo Electric Power Co is also behind this giant.

It will front the Pacific Ocean, have four reactors, produce 4400 megawatts, use 150 tonnes of uranium a year, and will cost $1.35 billion. Once again, through an interpreter I query the capital cost, but am told that is correct.

The first of these reactors will come on stream in 1982, and the other three will follow a year apart.

Judging on progress so far this plant will easily meet this schedule, and will help keep Japan one of the world's leading exponents of the atom for energy.

Whether Japan will meet targets for A-power production that the bureaucracy is projecting is another thing.

Mr. Toru Kimura, chief economist, Research Division, Institute of Energy Economics, believes that the

Three Mile Island accident will retard nuclear power generation plans.

"Although none of Japan's nuclear power plants was designed by Babcock and Wilcox the designers of TMI plant, Japan does have nine similar pressurised water reactors," he said.

Altogether Japan has 21 plants already commissioned, and by definition they are in the easiest areas to build.

New plants face increasing public resistance to land resumption for the plants.

* * *

Some Australian traders in Tokyo say we can revise downward our expectations of uranium sales here.

But Mr Masao Takaya begs to differ. He is manager of the nuclear energy department of the giant trading house C. Itoh and Co.

One of his responsibilities is to organise the equity Japanese companies will take in the Ranger uranium mine operator, Energy Resources of Australia Ltd.

Japan will take 10 percent of equity in the company, West Germany 10 percent and Britain 5 percent.

Mr. Takaya also expects Japan to take 40 percent of Ranger production.

In his Tokyo office, he said the Northern Territory mine should start producing in 1981 and, because some power utilities had not written enough forward contracts, it might start exporting about 1000 short tonnes annually to Japan from 1982.

Mr. Takaya doesn't see any problems in bringing uranium to Japan, even if there are objections by some unions.

"Uranium is totally different to coal or iron ore. It's so easy to move. You have such tremendous power in a few drums" he said.

But the big problem of atomic power doesn't lie in the mining of uranium that Australia will do.

It seems to me the big technological hurdle is treatment and disposal of radioactive wastes.

Japanese atomic power industry experts say that reprocessing of wastes, so they can be used again, will reduce dramatically the amount of high-level radioactive left-overs.

But Page 25 of Japan's Atomic Energy Commission annual report carried some worrying comments.

"Work is now being done to set up criteria concerning solidified low-level radioactive waste to be sealed and dropped in the sea, and test studies are now being made concerning the management of the solidified waste," the report says.

I accept that the water racing back into the Pacific Ocean from the Fukushima nuclear plant poses no immediate radioactive threat.

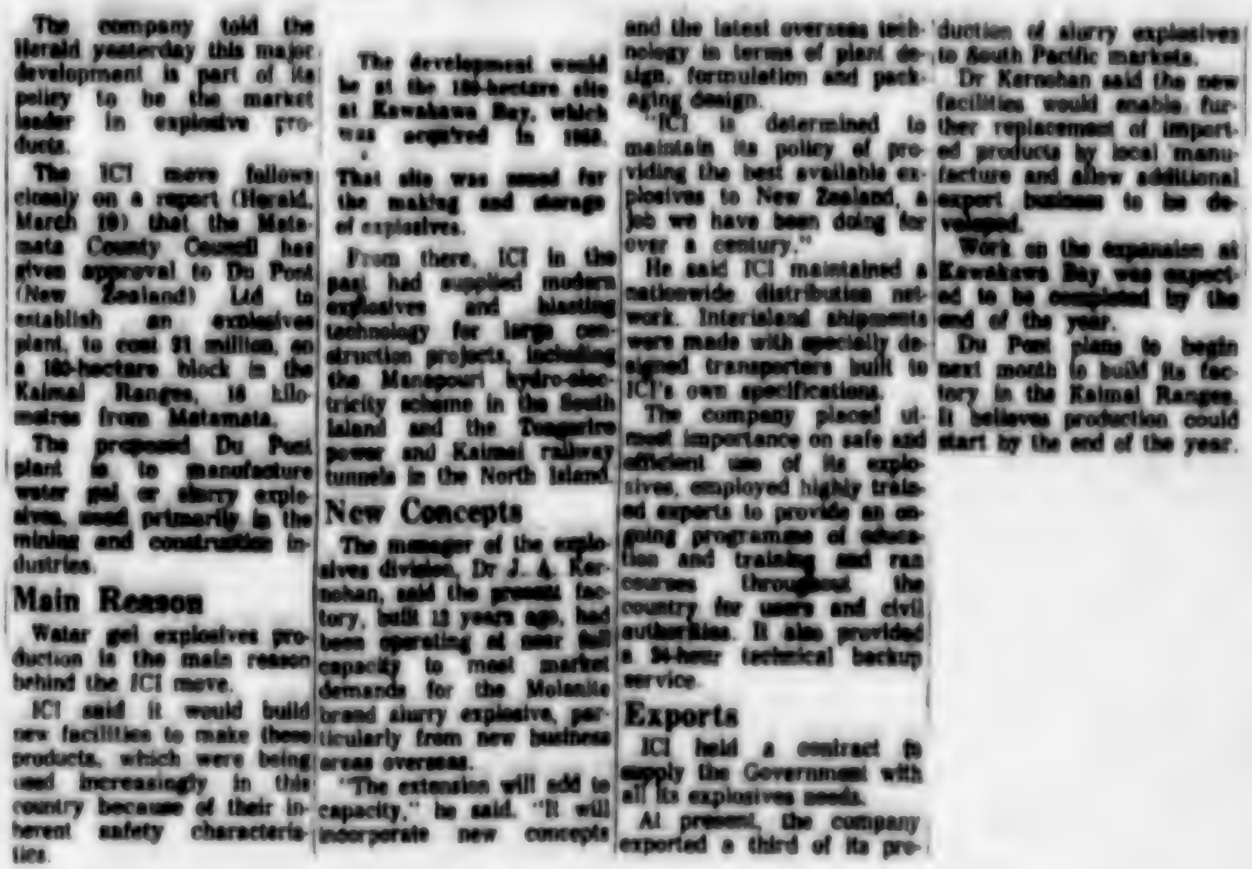
But the concept of Japan dropping waste into the sea is a new game altogether.

CSO: 5100

ICI TO EXTEND EXPLOSIVES PLANT AT KAWAKAWA BAY

Auckland THE NEW ZEALAND HERALD in English 26 Mar 80 Sec 3 p 3

[Text] About $1 million is to be invested by ICI New Zealand Ltd in re-equipping and extending its explosives division operation at Kawakawa Bay in the Firth of Thames:



The company told the Herald yesterday this major development is part of its policy to be the market leader in explosive products.

The ICI move follows closely on a report (Herald, March 19) that the Matamata County Council has given approval to Du Pont (New Zealand) Ltd to establish an explosives plant, to cost $1 million, on a 180-hectare block in the Kaimai Ranges, 18 kilometres from Matamata.

The proposed Du Pont plant is to manufacture water gel or slurry explosives, used primarily in the mining and construction industries.

Main Reason

Water gel explosives production is the main reason behind the ICI move.

ICI said it would build new facilities to make these products, which were being used increasingly in this country because of their inherent safety characteristics.

The development would be at the 180-hectare site at Kawakawa Bay, which was acquired in 1968.

That site was zoned for the making and storage of explosives.

From there, ICI in the past had supplied modern explosives and blasting technology for large construction projects, including the Manapouri hydro-electricity scheme in the South Island and the Tongariro power and Kaimai railway tunnels in the North Island.

New Concepts

The manager of the explosives division, Dr J. A. Kernohan, said the present factory, built 12 years ago, had been operating at near full capacity to meet market demands for the Molanite brand slurry explosive, particularly from new business areas overseas.

"The extension will add to capacity," he said. "It will incorporate new concepts and the latest overseas technology in terms of plant design, formulation and packaging design.

"ICI is determined to maintain its policy of providing the best available explosives to New Zealand, a job we have been doing for over a century."

He said ICI maintained a nationwide distribution network. Interisland shipments were made with specially designed transporters built to ICI's own specifications.

The company placed utmost importance on safe and efficient use of its explosives, employed highly trained experts to provide an ongoing programme of education and training and ran courses throughout the country for users and civil authorities. It also provided a 24-hour technical backup service.

Exports

ICI held a contract to supply the Government with all its explosives needs.

At present, the company exported a third of its production of slurry explosives to South Pacific markets.

Dr Kernohan said the new facilities would enable further replacement of imported products by local manufacture and allow additional export business to be developed.

Work on the expansion at Kawakawa Bay was expected to be completed by the end of the year.

Du Pont plans to begin next month to build its factory in the Kaimai Ranges. It believes production could start by the end of the year.

CSO: 5100

FRG REPORT ON GDR, CSSR NUCLEAR POWERPLANT SAFETY

DW241447 Frankfurt/Main FRANKFURTER RUNDSCHAU in German 18 Apr 80 p 14 DW

[Text] Re: Written minor question of deputies Dr Probst, Dr Warnke, Lenzer, Pfeifer, Benz, Engelsberger, Dr Hubrig, Dr Riesenhuber, Dr Freiherr Spies Von Buellesheim, Gerstein, Schroeder (Lueneburg), Dr Laufs, Dr Sprung, Roehner, Pfeffermann, Dr Stavenhagen, Mrs Dr Walz, Dr Mueller, Dr Koehler (Wolfsburg), Dr Jobst, Niegel and the CDU/CSU faction related to the security standards of nuclear powerplants in the GDR and in Czechoslovakia (printed matter 8/3777).

I [the federal minister of the interior] answer the written minor question in agreement with the chief of the Federal Chancellory, the federal minister of foreign affairs, the federal minister of research and technology, the federal minister of economics and the federal minister of inner-German affairs as follows:

Preliminary Note

No official data is available to the Federal Government on the security standards of nuclear powerplants in the GDR and in the CSSR (Czechoslovakia). This is why the Federal Government in its reply to the questions at issue must revert to the generally available technical literature and information published in the framework of the International Atomic Energy Agency (IAEA). Moreover, information carried in the conference report "Nuclear Energy Policy of the CEMA Countries" published by the "Standing Secretariat for the Coordination of the Federally Sponsored Eastern Europe Research" were also taken into account.

In answering the individual questions this situation will not be pointed out each time.

1. Where are nuclear powerplants in the GDR and Czechoslovakia located, as far as the Federal Government knows, and what are their capacities when in operation, under construction or in the blueprint stage?

A) GDR

In the GDR the Rheinsberg nuclear powerplant with a capacity of 80 MWE and the nuclear powerplant north in Lubmin near Greifswald with a 3 X 440 MWE pressurized water reactor of the Soviet Novovoronezh-440 (WWER-440) type are in operations.

Block four of nuclear powerplant north is under construction which, according to available information, is to be commissioned in 1980. In addition, the nuclear powerplant north will be extended to eight reactor blocks with a total capacity of 3,520 MWE.

In 1974 construction of the Stendal nuclear powerplant near Magdeburg was agreed on with the Soviet Union. Meanwhile, four powerplant blocks of 440 MWE each of the above-mentioned WWER-440 type are under construction there. Another four blocks are projected, with new installations of the Soviet WWER-1000 type also being considered. A further additional development of the nuclear powerplant capacity in the GDR which also includes breeder reactors is being considered.

B) CSSR

In the CSSR in Jaslovske Bohunice (about 30 km northeast of Bratislava) the nuclear powerplant A-1 (a heavy water natural uranium reactor with a gas cooling system with a capacity of 110 MWE which was developed in the CSSR) and the nuclear powerplant V-1 of the Soviet WWER-440 type are in operation.

According to available information, the second block of Jaslovske Bohunice as well as two blocks in Dukovany (about 20 km southwest of Brno) of the WWER-440 type are under construction. The IAEA report of 1 January 1979 also mentions the project announced in 1975 of the V-3 nuclear powerplant in Leviece (about 90 km east of Vienna) (2 X 440 MWE).

In addition, another five nuclear powerplant blocks of the WWER-440 type have been planned for operation between 1983 and 1986 at the following places: Dukovany with 2 X 440 MWE, Leviece with 2 X 440 MWE and Brno with 440 MWE.

2. Is it correct that Soviet pressurized water reactors of the 440 MW Novovoronezh type are always used at least for the nuclear powerplants in operation or under construction, and is it correct that these installations for cost reasons are equipped neither with a containment nor with an emergency cooling system and pressure reduction condensers?

3. Does the Federal Government consider the safety standard of the Novovoronezh 440 type reactor to be sufficient, and is it correct that for safety reasons construction of this reactor type is not permitted in any Western country of the world?

4. Is it correct that the Novovoronezh 440 type reactor installed in Finland had to be refitted for safety reasons by the U.S. firm Babcock and Wilcox with a full pressure containment and a fourfold high pressure emergency cooling system, and what are the reasons why an ice condenser had to be installed in addition?

For the nuclear powerplants under construction and in operation in the GDR and the CSSR mostly Soviet pressurized water reactors of the WWER-440 type are used. But according to reports, pressurized water reactors of the Soviet WWER-1000 Novovoronezh type will in the future be built in Eastern bloc countries.

From the information available it can be concluded that regarding nuclear powerplants different safety considerations are applied in the Soviet Union than in the West. These safety considerations are based on a simple and robust technology where no serious failures are assumed (such as for instance in the West the breakdown of a large cooling agent line), so that the safety systems existing in the West such as pressure resistant reactor containers (containments) or sophisticated and multiple emergency cooling systems beside the main cooling systems are considered nonessential there. However, the Soviet nuclear powerplants of the WWER-440 type also have emergency systems for specific incidents, which can, however, not be compared with the safety devices of Western reactors because of their different construction and for lack of detailed information.

For the construction of a Soviet type nuclear powerplant in Finland the local authorities demanded additional safety devices which were installed by the U.S. firm Westinghouse and German firms.

Since the device could not have been installed in a full pressure containment which is used in the West, because the essential layout characteristics of the nuclear steam production system were retained, the Finnish authorities decided to install an ice condenser. Such a system has the effect that if steam escapes (in case of a pipe burst, for instance) it can be condensed quickly and thus pressure in the containment kept low.

A delegation of the Domestic Policy Committee of the Bundestag, during a trip to Scandanivia in autumn 1979, informed itself about this system.

More recent Soviet nuclear powerplant types (like the WWER-1000 type) have provided for additional safety devices (for instance, a full pressure containment for keeping the consequences of a break of a big cooling agent line under control). Thus the Soviet Union is coming closer to Western safety solution.

We have no information about accidents in nuclear powerplants in the East bloc. Whether this is due to the nonexistence of such accidents or the policy of information there, is beyond the knowledge of the Federal Government. However, the company running the mentioned Soviet type Finnish nuclear powerplant has confirmed that the Soviet plant works reliably and satisfactorily. Following the accident of the U.S. nuclear powerplant in Harrisburg in March 1979 the Federal Government took an initiative at the IAEA in Vienna to intensify the efforts for a discussion and, if possible, coordination of the safety of nuclear technical installations between all countries in East and West using nuclear energy. An important result of these efforts will be an international conference in Stockholm in October 1980 on the safety of reactors.

5. Is the Federal Government able to confirm reports that Denmark and Sweden protested in East Berlin, because given the construction of GDR reactors major accidents which might result in a pollution of Scandinavian areas cannot be ruled out?

The Federal Government has no information about an official protest of the Danish and Swedish governments with the GDR Government. Here the protests of Danish and Swedish nuclear power opponents against nuclear powerplants in the GDR seem to have been mistaken for official protests.

6. Does the Federal Government share the view that the accident in Harrisburg, which was a result of human failure, would very likely have led to the most serious damage with a Novovoronezh 440 type reactor?

The reason for the Harrisburg accident was not human failure alone, but an unfortunate coincidence of human and technical faults. A well-founded answer to the question of the possible effects of a similar accident with a Soviet WWER-440 reactor type cannot be given because of the lack of detailed information about the construction of such a plant.

7. Is the Federal Government able to confirm the report that the safety system of the Novovoronezh 440 type at best can resist the break of a pipe with a diameter of 20 cm at most and that therefore a major accident will get out of control?

The Soviet safety considerations proceed from the assumption that basically it is sufficient to give the most important reactor components and the primary circuit very stable and additional safety dimensions to rule out a failure. Accordingly, only pipe breaks and leaks in secondary systems are assumed which need to be controlled by the safety systems.

Contrary to the safety considerations in the West, major accidents are not assumed. Therefore, it cannot be ruled out that in the event of a major pipe break the consequences will not remain limited to the plant interior.

8. Does the Federal Government consider the answer by State Secretary Dr Hartkopf on 27 August 1979 to a relevant question by Deputy Ludewig to be reasonable that "the Federal Government assumes that despite the different construction of nuclear powerplants in the FRG and the GDR, the population of the FRG living in areas near the GDR border is not endangered by existing nuclear powerplants in operation in the GDR because of the distance of these nuclear powerplants and the mostly western wind direction"?

9. Is the 17 December 1979 SPIEGEL report correct that the responsible official in the Ministry of the Interior, Wilhelm Sahl, who is in charge of the safety of reactors, showed "genuine concern" over this state of affairs, but added: "True, the wind mostly blows to the east, but that is [sentence incomplete due to printing error].

As has already been stated, the Federal Government is not informed in detail about the safety provisions of nuclear powerplants of the Eastern type, because publications from the Eastern bloc countries do not give a comprehensive picture. It is, therefore, unable to assess the safety of these plants to the extent this is possible and customary only upon a careful examination of the technical and organizational details of nuclear powerplants in the FRG or its Western neighbor states.

Conversely it must be noted that a large number of scientific articles have been published on the safety provisions of Western nuclear powerplants, which are also available to experts in the East bloc. In addition, numerous scientists from the East bloc participate in the work of the IAEA. Thus the Federal Government assumes that the Western safety considerations are known to the constructing engineers of nuclear powerplants in the East and that basic principles and rules of the safety of reactors are also applied in the East and that the responsible authorities there do not jeopardize the security of the population (nor the high value of investment of the plants), because it would above all be those working at the particular plant and the population in the immediate neighborhood which would be affected by reactor accidents.

The Federal Government, therefore, proceeds from the assumption that the fundamental interest these states have in protective measures largely rules out a danger to the relatively far-away regions in the FRG and that the answer given to Deputy Ludewig continues to be correct also today.

Realizing that the consequences of technological developments can have effects across borders, which by no means are limited to the field of nuclear technology but comprise many fields of technology, chemistry, biology, etc., the Federal Government, after the Harrisburg accident, took initiatives for an international coordination of safety and environmental protection measures. For the field of nuclear energy the conference of the International Atomic Energy Agency will be held in

Stockholm in October 1980 to discuss safety measures for nuclear powerplants, to which the Eastern bloc states have also been invited. This conference by the IAEA is to be seen in the context of efforts by the Federal Government for intensifying international cooperation in the field of reactor safety within the scope of the IAEA.

10. Do we have to conclude from the answer cited of State Secretary Hartkopf that the Federal Government to date has taken no safety precautions in case of a reactor accident in the GDR or the CSSR?

11. If this conclusion is correct, isn't this attitude of the Federal Government inconsistent with the principle represented by all parties of the Bundestag that safety aspects must be given top priority for the construction of nuclear powerplants?

Protection when it comes to disasters, including in the surroundings of nuclear technical installations, falls within the sole responsibility of the Federal Laender.

In accordance with the "Outline Recommendations on Protection in Case of Disaster in the Surroundings of Nuclear Technical Installations" plannings on protection measures in case of disaster on the territory of the FRG cover a distance of 25 km from a respective installation. The nuclear powerplants of the GDR or the CSSR are located farther away than 25 km from the territory of the FRG. Therefore, to the knowledge of the Federal Government the Federal Laender have not taken any specific precautions aimed at warding off the consequences of accidents in reactors of the GDR or the CSSR.

Nonetheless the administrative and material safety measures of disaster protection would also be available in cases where citizens in the FRG might be endangered as a result of an accident in a nuclear powerplant abroad or in the GDR.

12. Why has the Federal Government failed to date to have an expert investigation made of the acute danger potential which may exist for the population in the FRG as a result of the Novovoronezh 440 type reactor in operation?

The Federal Government fails to see a neglect.

For an assessment of the consequences of radioactivity releases resulting from accidents the studies developed in the FRG on the consequences of accidents can be consulted. The fission product inventory of Soviet nuclear powerplants of the WWER-440 type is sufficiently known.

Assuming that it comes to a serious accident in a nuclear powerplant in the GDR or the CSSR, the consequences of the accident can be assessed in accordance with the results of the "German Risk Study." Otherwise reference is made to the answers given to questions 8 and 9.

13. Regarding the announcement made by Parliamentary State Secretary Von Schoeler on 18 January 1980 (answer to the written question by Deputy Dr Henning) that "in the exchange of views between Federal Chancellor Schmidt and Chairman of the GDR State Council Honecker a discussion of these...problems is desired," does the conclusion have to be drawn that this serious problem to date has not been a subject of talks with the governments in East Berlin and Prague?

The Federal Government took an initiative at the IAEA in Vienna last year to intensify aspirations for the discussion and possibly harmonizing of the safety of nuclear technical installations between all countries in East and West using nuclear energy. An important result of these efforts will be an international conference on reactor safety in Stockholm in October 1980. Naturally the Federal Government is particularly interested in participation by our neighbor states--especially also the CSSR and the GDR--in the planned international coordination of safety standards for nuclear powerplants.

In April 1978 and in March 1979 the Federal Government told the GDR Government--in connection with the latter's objections to waste disposal center at Gorleben--that it expects the GDR to be prepared to inform the FRG about nuclear technical installations which have been set up and are in operation or are to be set up in the border area.

14. Has the Federal Government gathered information within the scope of inner-German contacts about the planned radioactive waste deposit of the GDR in Bartensleben-Morsleben, and if so, what conclusions has it arrived at and how does it assess the project planned by the GDR?

According to the available information only medium and weakly active waste is disposed of in Bartensleben-Morsleben; highly radioactive nuclear waste is to be transported to the Soviet Union for reprocessing. Otherwise reference is made to paragraph 2 of the answer to question 13.

CSO: 5100

THERMONUCLEAR DEVELOPMENTS UPDATED

Paris LE MONDE in French 12 Mar 80 p 17

[Article by Maurice Arvonny: "A Superconducting Tokamak"]

[Text] Research on thermonuclear fusion through magnetic plasma confinement is relying on equipment which is increasingly bulky, complex, and costly. The Tokamak at Fontenay-aux-Roses (TFR), built by the Atomic Energy Commission (CEA), was of major significance since it held a world record for plasma temperature in 1976. In order to go on to the next stage, France has joined the other EEC countries to build JET (Joint European Torus). Located at Culham near Oxford, in England, JET will be, in the 1980's, the high-performance European facility capable of exploring a field which is still unknown; it will enable European researchers to remain at the level of their colleagues in the USSR, Japan, and especially the United States which has the most powerful installation at this time.

TFR also makes it possible to carry out certain studies, such as high frequency heating, whose results will probably lead to modifications in JET plans. But it will be increasingly outdistanced by the very progress it has made possible. An international facility, JET will not be able to keep all French physicists in its field occupied. In addition, certain studies important for the future can be carried out on a machine which is less universal than JET, but which is, on the contrary, specially adapted to a particular type of research.

Stronger Magnetic Field

Therefore the EEC is developing the Tore-II project. Tore-II will be a smaller Tokamak than JET, but will be equipped with superconducting coils to confine the plasma: in this way, stronger magnetic fields can be obtained than with conventional magnets such as the ones that will be used on JET. Researchers are virtually convinced that very strong magnetic fields will be indispensible, and that the machine which will succeed JET in the 1990's will have to rely on superconductivity. Thus the first objective of Tore-II is to reveal the technical problems raised by the use of superconductivity in a Tokamak. The precise problem is the achievement of a strong magnetic field (4.5 teslas) over a large volume. Large superconducting magnets have already been built for particle physics experiments, but they are designed to provide a field which remains constant over long periods. By contrast, the Tokamak magnetic field must change frequently, which gives rise to new difficulties.

A second objective is the study of high-frequency plasma heating, since recent work indicates that this is a technique of the future. Tore-II must make it possible to obtain large heating capabilities, going from 100 to 10,000 continuous megawatts. This is the order of magnitude which will be required for future reactors producing energy through thermonuclear fusion.

Finally, the third objective is the study of plasma impurities, and the means to eliminate them. Pure plasma is composed of hydrogen isotopes (deuterium and tritium in future reactors, deuterium alone in experimental machines where this makes it possible to avoid the serious radioactivity problems associated with the presence of tritium). Fusion reactions produce helium enrichment in the plasma, but this is not a serious drawback.

On the other hand, plasma is rapidly poisoned by heavier nuclei loosened from the walls: for instance, 0.1 percent of iron is enough to prevent fusion triggering. And in spite of the magnetic fields confining the plasma, atoms are always loosened from the enclosure walls: techniques have been developed to limit this phenomenon, for example the diverter system -- an annular conductor around the plamsa, whose magnetic field extracts heavy ions from the plasma and directs them to an absorber.

But the technical problems are very arduous, and could be insoluble when industrial applications are attempted. Tore-II is designed to allow the testing of another solution: in simple terms, this would involve surrounding the very hot plasma, where fusion is triggered, by a layer of much colder plasma; the ions of this cold plasma would then have insufficient energy to remove atoms from the surface with which they are in contact. According to Mr Aymar, director of the Tore-II project, this is "an unproven potential solution", but one on which great hopes may be placed.

Tore-II therefore appears as a technological and physical research device, for studies which will be indispensible after JET. This "after JET" period is not well defined as yet, although a commission of the International Atomic Energy Agency (AIEA) has conducted some preliminary studies in this area. These have shown that in all countries where fusion research is presently taking place, the future is being considered roughly in the same terms.

This has resulted in a preliminary project for an international Tokamak (Intor), whose main characteristics along with those of JET and Tore-II are shown in the table below, it being understood that these characteristics are still very tentative. Intor would be a Tokamak operating by ignition, meaning that enough fusion reactions would be triggered in it to maintain plasma heating. This is not yet the break-even point, the threshhold where fusion produces enough energy to compensate for what has been used to create magnetic fields, heat plasma, and so on. But it would be an important step which would, notably, make it possible to approach all the radioactivity problems linked to the presence of tritium and of a very large neutron flux.

Main characteristics of three Tokamaks

	JET	TORE-II	INTOR
Large radius of plasma annulus (meters)	3	2.15	5.3
Small radius of plasma annulus (meters)	1.2-1.8	0.75	1.4
Magnetic field at center of plasma (teslas)	2.2-3.3	4.5	5
Plasma current (mega-amperes)	3 -4.5	1.7	5
Duration of current (seconds)	10	15 to 30	200

The table shows the main characteristics of three Tokamaks: under construction (JET), at the planning stage (Tore-II), or merely proposed (Intor.) In the latter case, the characteristics given can still change greatly. For JET,, the torus crossection is not circular, but roughly elliptical; therefore two values are given for the small radius. Two values are also given in two other JET listings: the first is the target value at end of construction; the other will result from subsequent work. The table shows that Tore-II, smaller than JET, will have a stronger magnetic field, close to the one which must be obtained -- in a much larger volume -- for the future Intor project. As a reference, it is accepted that the cost of a Tokamak varies, depending on elements considered, as the square or the cube of the large radius.

Intor requires a superconducting magnet twenty times more powerful than the one for Tore-II. It implies plasma heating capabilities going beyond the present state of the art. The project is thus unfeasible at present, and the role of Tore-II in the final analysis is to develop the technologies which will then become necessary.

Technically, Tore-II is like a conventional Tokamak: an annular enclosure with a very good vacuum, surround by two sets of coils to create the magnetic field; the whole is enclosed within an access structure serving both as a mechanical support and a core for the transformer (the combination of the coils and the plasma.) Only one of the sets of coils is superconduve: it consists of eighteen coils evenly spaced around the annulus, each one with a diameter of 2.20 meters. They are made of a rectangular cross-section (2.5 mm by 5.6 mm) copper wire, in which are embedded 11,000 filaments of a niobium and titanium alloy which becomes superconducting (meaning that its electrical resistance becomes zero) at very low temperatures. Each coil is enclosed in a housing filled with superfluid helium at 1.8 degrees Kelvin, the outside of the housing being maintained at 4.2 Kelvin by helium gas circulating under pressure.

Financial Problems

The anticipated cost of Tore-II, excluding civil engineering and salaries, is about 200 million francs (1978 value), of which Euratom is ready to finance 45 percent. The project is ready technically, but the CEA is still facing financial obstacles: it has the credits necessary to begin operations in 1980, but this involves relatively minor sums, and the bulk of expenses will be incurred in the years to follow. A decision might be reached in the mid-1980's, when the 1981 budget is more clearly outlined. But while there is uncertainty about the date of a firm decision, the decision itself is not much in doubt. Jean Teillac, CEA high commissioner, believes that Tore-II is "an indispensible element for fusion research." If the decision is made rapidly, Tore-II could be placed in service in 1984 or 1985.

Although it will mean increased costs, Tore-II will not be built at Fontenay-aux-Roses but at Cadarache, and the CEA section concerned will be decentralized; this of course will raise the usual staffing problems. It would have been possible though difficult to install Tore-II at Fontenay-aux-Roses, but this would have blocked all future development: Fontenay-aux-Roses is in a highly developped urban area where it is prohibited to build tritium treatment facilities, which will be indispensible at future stages of fusion development. In any case, the CEA plans to gather at Cadarache all teams currently working on fusion at Fontenay-aux-Roses and at Grenoble. This will establish a solid center which can eventually be a proposed site for the successor to JET. During debates on the location of JET, the French proposal to build at Cadarache had not received much support, the main argument of our associates being that fusion was not being studied there, and that it was better to build JET in a center where the necessary researchers, engineers, and technicians would already be available.

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CSO: 5100

SECOND NUCLEAR WASTE SITE DISCUSSED

Paris LE MONDE in French 27 Feb 80 p 36

[Article by Paul Chappel]

[Text] Will the Bois-Noirs mine, located within the rural district of Saint-Priest-la-Prugne, on the border of the departments of Loire and Allier become the first underground cemetery for nuclear wastes? The Compagnie Generale des matieres nucleaires (COGEMA) [National Company of Nuclear Materials], branch of the Atomic Energy Commission (CEA) has just requested the permission to create there a storage center for wastes of low and medium radioactivity on the surface, for the time being. The first dump of this type was installed since 1966 next the La Hague's reprocessing plant, not far from Cherbourg.

The CEA had been operating for 20 years a uranium mine and an ore processing plant on the Bois-Noirs site. Both employed about 350 persons. The deposit is now depleted and the plant which used to produce 140,000 tons of uranyl nitrate is to be dismantled. Part of the personnel is to be employed in a similar mine which has just been opened up in Lodeve (Herault).

The "nuclear dump" will be located at 2,500 meters from the village of Saint-Priest-la-Prugne (717 inhabitants) which it, itself at the center of a triangle whose vertices are Thiers (Puy-de-Dome), Roanne (Loire) and Vichy (Allier). It is to receive the wastes from nuclear plants and power stations of the south-east of France.

The building for reception and control of the wastes, warehouses and a packing plant will be erected on an area of 2 hectares. The final storage will be organized on 3 or 4 hectares in an old quarry on the mountain side The center which extends altogether over about 12 hectares might accomodate on the whole, 300,000 cubic meters of wastes.

The wastes of low and medium radioactivity constitute, for 1980, a volume of 15,000 cubic meters including their packing. This amount has tripled since 1976, and if the present technology does not vary, the cumulative volume reached in France will reach a million cubic meters by the year

2000. The Bois-Noirs dump will therefore be sure, in the eyes of the public powers, of a long term activity. This is further assured by the possibility of extending the available areas by using the mine's old decantation basin.

The CEA says that the possibility is not excluded of galleries being dug in the granite on the mountainside and above water level. This phase would only be implemented after study, and will require a further permit application. But in any case there is no question of using the old mine galleries.

Located in a region which is not particularly exposed to earthquakes, the Bois-Noirs site was preferred to a dozen others, because of the geological and geophysical data acquired during the operation of the uranium mine during the last 2 decades. According to the CEA officials, it also offers "favorable characteristics from the viewpoint of the protection of the population and the environment."

COGEMA is going to file its application for this installation, and a public inquiry should be organized in May. The authorization decree might be signed by the prime minister by the end of 1980, and the operations would begin at the end of 1981, since the inauguration of the center is scheduled for early 1983. It will employ immediately about 30 persons, but the CEA has engaged to allocate the construction and the transport of the concrete "garbage cans" to local companies, which would mean another 30 jobs.

This is the main part of the contents of the file handed over by the CEA to the elected representatives of the Loire, without tempting them overmuch, not by a long way. At the recent session of the departmental assembly, the general councillors expressed their anxiety and skepticism.

In spite of the pleas of the 5 officials and experts who had come from Paris, they do not see what benefit the local economy could derive from this matter. The elected representatives were left above all with the unpleasant impression that an attempt was being made to reassure them, rather than inform them.

Protest of the Elected Representatives

Mr Jean Thierry, Socialist municipal councillor of Roanne, member of the Town Planning Commission of this city is an associate professor of natural sciences. He observed that: "The geological maps of Saint-Priest-la-Prugne indicate that there is an extremely abundant circulation of waters, both superficial and deep, precisely at mine level." Mr Thierry draws a parallel between this geological observation and the project for creating a radio-ecology laboratory laboratory on the very site. It would operate under the CEA Protection Services and would work with the university and Mining School of Saint-Etienne. It will study the behavior of the packing of the wastes in the ground and subsoil. Well, Mr Thierry noted that:

"If the behavior of the packages placed in the galleries, that is their evolution in time, is being studied, it is because the specialists are posing questions to themselves." Moreover, Mr Thierry recalls that "there is also provision for the study of the propagation of radioelements in the water and through the food chain."

In this context it is not surprising that the mayors of 10 rural districts, of the Saint-Just-en-Chevalet region, beginning with Saint-Priest-la-Prugne, Mr Jean Rathier, supported by the councillor general and Mr Jean Auroux, mayor of Roanne and representative (Socialist Party) have refused categorically for the old mine to be used as dump for radioactive wastes. They claim that: "The control of the wastes has not been mastered. There is no question of the representatives being fooled: 30 jobs for operating a nuclear garbage dump do not replace the jobs lost. The presence of the center would certainly prevent other economic activities from being established in our locality."

This is the opinion of about 15 political organizations, trade unions, rural family and ecological agencies which manifested on different occasions their opposition to the creation of the nuclear dump.

9018
CSO: 5100

EDF EXPECTS TO ORDER TWO BREEDER REACTORS BEFORE 1985

Paris LE MONDE in French 27 Feb 80 p 40

[Article by Jean-Francois Augereau]

[Text] Mr Michel Hug, Equipments Director at the Electricite de France [French Electric Company] confirmed on 25 February EDF's intention to order before 1985 2 breeder reactors derived from the Super-Phenix unit (1200 MW) which is being built by Germans, French and Italians east of Lyon on the Creys-Malville site.

The order for the first unit may be signed in 3 years, around the time when the Super-Phenix is to be put into service (end of 1983). This type of reactor is of deepest interest to government authorities, since it permits the multiplication of the nuclear fuel resources by a factor of 50. However, the investments for these reactors are higher than for the line of reactors using light water and enriched uranium. The engineers are therefore attempting now to reduce the costs of the future units.

A study on this point was ordered at the end of 1978 from Novatome (Creusot-Loire, Althom-Atlantique, Neyrpic and the French Atomic Energy Commission) to see the extent to which it would be possible to optimize the components and the vessel of Super-Phenix to increase from a power of 1200 to 1500 megawatts. It was found from these investigations that the economy which could be made for the reactor vessel alone might be 15 percent for the order of a nuclear unit, and 30 percent for an order of 4 units. That is considerable, if one recalls that for Super Phenix this part represented about 50 percent of the overall cost, estimated at about 8 billion francs.

However the reduction of costs, the control of prices would not be sufficient for the breeders to produce competitive kilowatt-hours. To achieve this, further technical progress must be achieved in the area of fuel cycle, increased combustion rate, etc., and fine evaluations must be made on the operation of such a power station, which should be permitted partially by Super Phenix (whose safety tank and main reactor vessel are to be mounted on 5 May and 5 June 1980 respectively).

9018
CSO: 5100

SWEDEN

AUTHORITIES BEGIN TO CONSIDER NUCLEAR ATTACK PREPARATIONS

Stockholm SVENSKA DAGBLADET in Swedish 10 Mar 80 p 4

[Article by Ingmar Lindmarker]

[Text] Sweden is regarded as having one of the best civil defense systems in the world but if war breaks out there will not be enough shelters for the entire population.

There would be a shortage of from 2 to 3 million shelter spaces, some 4 million Swedes would be without gas masks against ABC [atomic, biological and chemical] weapons in a crisis and preparations to deal with the results of a nuclear war have been delayed.

Changes in thinking are going on within the civil defense system. The next few years will be critical with a new plan to replace the evacuation of almost the entire population during mobilization and warfare with stepped-up construction of shelters.

"The basic new viewpoint on evacuation, which among other things will lead to the elimination of the instructions in the telephone directories, is ready for presentation this spring," said the general director of the Civil Defense Board, Gunnar Gustafsson. "It should be implemented during 1982."

Protection Without Cost

Now the politicians are being asked for funds for acceptable protection in a nuclear war. In the past the directive has been that such protection "should be provided when this can be done without incurring sizable capital costs."

Since all Swedish defense planning for decades has been based on conventional warfare without nuclear weapons the Civil Defense Board is the first Swedish agency to sound the alarm concerning other possibilities. The unthinkable has again become thinkable.

"It is unrealistic to think that the enormous emphasis on nuclear arms in Europe and elsewhere does not involve increased risks that such weapons will be used," Gunnar Gustafsson told SVENSKA DAGBLADET.

"The nuclear arms threshold is sinking and there is nothing to indicate that we in particular would be spared in the event of a nuclear war."

There is growing interest in civil defense in international crises. The nuclear build-up in Europe by the Warsaw Pact lands and NATO and the tension resulting from the Soviet invasion of Afghanistan have fanned the debate on public protection in such countries as the United States, Great Britain and France.

Naive Attitude

"We talk of conventional warfare as almost the only conceivable kind but almost no one shares this evaluation," said the civil defense director in Varmland, Folke Klefbom. "We are much too naive in our attitude compared with many other countries, especially those in the East bloc."

With regard to civil defense the periodical AKTUELLT said that Sweden is "the only major exception" to the rule concerning information and popular protection against ABC weapons, i.e. nuclear, biological and chemical weapons.

The Civil Defense Board's warning, expressed in a response to the latest report from the Defense Committee, corresponds to foreign evaluations that the new arms build-up increases the risks of limited nuclear warfare. There is also growing uneasiness among Swedish security politicians about Sweden's exposed position on the firing line between the eastern SS-20 missiles and western cruise missiles with nuclear warheads.

Another sign of new thinking is that at the Defense Research Institute, FOA, they are now talking of the need for new studies of the effects of nuclear arms on the civilian population. Not since the beginning of the 1960's has a study been made of the effects of a nuclear war and that concerned terror bombing.

In the event of a limited use of nuclear arms or radiation fallout from nuclear explosions outside Sweden's borders modern shelters would be adequate, supplemented with gas masks. But both are in short supply in Sweden.

Gunnar Gustafsson said there is a total shortage of 2 to 3 million shelter spaces in the nation, half a million in Stockholm alone.

"From 1957 to 1976 no shelters at all were built in the centers of our 14 biggest cities," he said. It will take 30 to 40 years to make up for this.

Access to shelters varies considerably. There are almost none in many residential areas while the modern suburbs of larger cities have an oversupply.

The need for more shelters and a more even distribution of them is increasing now at the same time as the basic view of protecting the public during a war is under revision. In the past the idea has been to evacuate almost everyone in big urban areas in the case of mobilization and war. Now the word is to stay home if war comes.

The detailed instructions in the telephone directories, which include telling Stockholm residents to head for Varmland and Dalarna among other places, will disappear within a few years. The new idea is that as many as possible should stay as close to home as they can, with complete protection being made available to them there.

"This rethinking process is necessary due to the fact that both warfare and the structure of the population have changed," said general director Gustafsson.

6578
CSO: 5100

CD AUTHORITIES ADMIT LOW PREPARATION FOR SERIOUS NUCLEAR ACCIDENT

Stockholm DAGENS NYHETER in Swedish 5 Mar 80 p 27

[Article by Christina Kellberg and Lilian Ohrstrom]

> [Text] If a serious nuclear accident occurred today, for instance a core meltdown in the Oskarshamn nuclear power plant, no plan would be available for saving human life. The plans in existence apply only to small accidents.

"If we had a core meltdown we don't know what we would do. Our plans would cover only minor accidents, such as a broken pipe, in which small amounts of radioactivity would be disseminated," said Lars Henricsson, Oskarshamn fire chief.

"We have the iodine tablets and if something really disturbing happens we can send them out by mail. A girl called up and asked for some. Ulf Erlandsson, deputy fire chief here, promised her some. But she was a reporter for OSTRA SMALAND and just wanted to write an article.

"It came out on the whole back page of the paper with red and yellow headlines," said Erlandsson, somewhat annoyed.

"As far as we're concerned it would be better if people were given their own iodine tablets. If something happens we couldn't distribute them as quickly as they should be," Lars Henricsson said.

"If there is a major accident and the population must be evacuated we would have big problems. We don't have any clear instructions as to what to do in that case.

"We've had three exercises to correlate preparations. The last time we took 3 hours. We worked 20 minutes to get an old lady out of her living-room. She was on the phone and when she opened up she wouldn't go along.

"We won't be able to carry out the new plan calling for preparations inside an 8-mile radius. It isn't possible to carry out exercises with 150,000 people.

"They're talking a lot about core meltdowns today," said Lars Henricsson. "Personally I am more worried about a fire at the nuclear plant. What do we do if radioactivity in there is so high that we can't go in?"

Ulf Erlandsson sounded more heroic.

"A fireman has to expect to be called out for special purposes. We happen to have a nuclear power plant in our community."

Folder

How would the police react to a serious accident?

"The officer on duty would turn and take down the folder containing the instruction schedule," said Police Chief Stig Ericsson. "Everything that should be done is included in it."

Could Go Like This

If a serious accident such as a core meltdown should happen in Oskarshamn at the nuclear power plant it could have these results, according to director of defense Per Fredriksson.

If the wind is northeasterly the radioactive cloud will go in over Oskarshamn. Among other things the cloud would contain cesium, strontium and radioactive iodine. It would be 2000 degrees in temperature, extend several hundred meters up in the air and follow the wind. People would have to be evacuated within a 24-hour period.

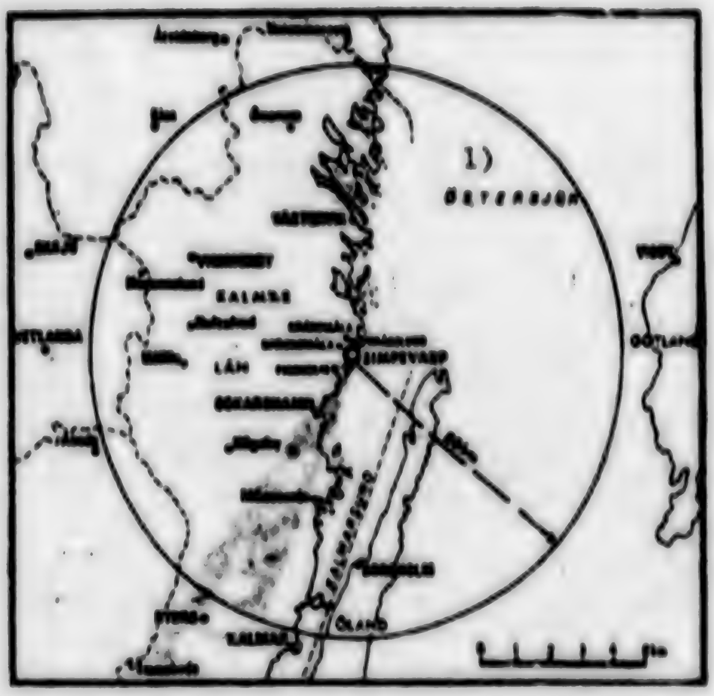
According to the Radiation Protection Institute's report, "More Effective Preparedness," people in the area would suffer these injuries: hundreds would become acutely ill, dozens of abortions would be needed, there would be tens of thousands of cancer cases, and tens of thousands would suffer genetic damage.

Per Fredriksson said that thousands or tens of thousands of square km of land would become radioactive. Large areas of ground could not be lived on for several hundred years.

Some 4200 industries would be affected. Their annual production value is 1.9 billion kronor.

Approximately 6000 cows, 4000 pigs and 450 sheep would go to waste. Their value is 26.3 million kronor.

And 3300 hectares of arable land would be destroyed. This has an annual harvest value of roughly 9 million kronor.



On this map we have indicated the sector that would be affected if the wind is blowing toward Oskarshamn during a major accident at the nuclear power plant. The circle shows the area that would be covered by accident preparations if the new proposal goes through. The areas outside the circle would not escape the radioactive cloud. But authorities hope that outside the 8-mile limit evacuation and rescue efforts can be improvised. The other places on the map show where radioactive measurements should be taken and where people would be evacuated.

Key:

1. Baltic Sea

The police force, the fire department and the Coast Guard are ready to respond if the alarm sounds for a nuclear accident in Simpevarp.

The emergency plans in existence today apply to accidents that "do not call for large-scale rescue efforts," in other words not a core meltdown. Public rescue efforts would proceed as follows:

The nuclear plant is supposed to alert the police who in turn alert the fire department, the county council and the Coast Guard. The plant is also under instructions to notify the county council directly.

Within 1 minute the first police and fire patrols should be on the way, with two men in each group.

"Drive to the Figeholm fire station. Pick up 200 iodine tablets and 200 instruction sheets to pass out with the tablets, an instrument to measure ionization radiation and a dosimeter. Each man swallows an iodine tablet."

Those are the police instructions. The police patrol is to barricade the roads leading to the nuclear plant at Krakemala and Spackemala. Every 10 minutes they will take measurements to see if any radiation is present.

"Don gas masks if radiation is detected. Then move further west in the direction of Farbo," the instructions say.

In the meantime the first fire patrol has swallowed its iodine tablets and gone out to indicate, i.e. measure radiation, at 13 locations between Figeholm and Krakelund.

They will be equipped with Geiger counters, a gas mask each, a dosimeter (which measures the radiation to which they are exposed) and 50 iodine tablets. The tablets will be distributed to people they meet along the way.

After 40 minutes indications should be ready and they will report them to the fire station in Oskarshamn.

During this time the fire department has called people to Figeholm fire station and the work of passing out iodine tablets to all within 2 km from the power plant and within 5 km in the prevailing wind direction will have started.

Three police patrols will assist in passing out iodine tablets and warning the public.

The Coast Guard, which has been alerted via Karlskrona, has been issued measurement instruments, gas masks and iodine tablets by the fire department and has taken two boats out to block the channel near the nuclear plant, pass out iodine tablets and warn vessels to leave the spot.

People will be warned to stay indoors and await further information on the P3 channel. The police and the fire department have a prepared statement to be read over the radio. It goes like this:

"The radioactive emission from the nuclear power plant in Simpevarp, Oskarshamn has ceased and there is no longer any risk in going outdoors in this area. Thoroughly air out all residential buildings. Open all ventilators, windows and doors so that all residences can be properly aired out."

Nuclear Society

"Many people are worried. And there is no report saying that the risk of a core meltdown is negligible.

"That's why I'm thinking of recommending preparations for a major accident of the core meltdown type," said defense director Per Fredriksson.

He is the one from the Kalmar County Council who is organizing emergency plans in the event an accident should occur at the Oskarshamn nuclear power plant.

Per Fredriksson was one of the people who decided that Sweden's first large-scale nuclear power plant would be located in Simpevarp. First he recommended it while he was a member of the Civil Defense Agency. He later supported the proposal when he came to the county council in Kalmar.

"Of course we knew about the dangers of nuclear power," he said. "The American radiation protection commission report talked of a surface as large as all of Sweden becoming radioactive in the event of a major accident.

"But the risk was thought to be so small that we were justified in taking it."

As defense director on the county council it then became Per Fredriksson's task to organize protection in the event of an accident.

"But the 1960 law on emergency preparations in the event of atomic accidents did not deal with what was thought to be so unlikely an accident as a nuclear core meltdown."

To find out the possible accidents for which he should be prepared Per Fredriksson went to OKG [Oskarshamn Nuclear Power Group] and asked them to describe what might happen.

Indoors

He was given a description of four conceivable accidents which was confirmed by the Radiation Protection Institute and the Reactor Location Committee (now the SKI, the Nuclear Power Inspectorate).

"So little radioactivity should escape in these accidents that it would be almost imperceptible. By and large it would be sufficient if the public stayed indoors.

"But we felt we should do everything we can to make sure the public does not receive any extra doses of radiation. Current plans are based on that idea."

These plans call for blocking roads, warning the public and issuing iodine tablets within a 15 km radius of the nuclear power plant. If the radiation level is above 10 rads people will be evacuated to Oskarshamn.

One man has been appointed to make decisions on his own if time is short.

"And that's me," said Per Fredriksson.

The command group in Kalmar is the brains of the organization.

"At my service will be the police, customs service, fire department, Kalmar Radio and the Atomic Accident Emergency Board (located at SSI [Radiation Protection Institute] in Stockholm).

"But there are weaknesses in the organization," Per Fredriksson revealed.

"If an accident occurs on a Saturday during the summertime it certainly won't be easy to get hold of anybody on the county council. We need someone on 24-hour duty.

"But three governments, two of them Center governments, have said no to this. I interpret this as meaning that they don't feel the risk of an accident is that big."

But there are other weaknesses, as three mock exercises have shown. The alarm network is poor. If you're asleep the sirens won't wake you up.

Iodine Tablets

"There is a proposal that all telephones within a distance of 2 miles from the plant should ring and the sirens in Oskarshamn should be set off downtown if anything happens," Per Fredriksson said. "And that police and military helicopters be equipped with special sirens so that people working in the forests can be warned.

"And the iodine tablets that provide some protection against damage to the thyroid gland should be passed out to the population in advance," he said. "To have maximum effect they should be swallowed before one inhales radioactive substances.

"Current preparations are inadequate if the probability of a core meltdown is greater than has been believed," said Per Fredriksson. "I can't exclude this risk if the experts won't."

On 11 March the county council in Kalmar will decide on a proposal to improve preparedness if an accident occurs at the Oskarshamn nuclear plant. This proposal is part of the Radiation Protection Institute's report, "More Effective Preparedness," which is under consideration. After the popular referendum the government will decide whether the preparations in nuclear counties need improvement as recommended by the report.

If the plan goes through the effect on Kalmar County will be that all fire departments in the county, all police districts and police and military helicopters will be put to work if a core meltdown occurs. They will measure radiation levels.

Six Hours

An evacuation plan for everyone within 6 to 8 miles from the nuclear power plant is being set up. There is nothing to indicate that the damage would stop after 8 miles but from that point on improvisation would be necessary according to Per Fredriksson.

He does not believe it would be difficult to evacuate all of Oskarshamn.

"We would have to move 25,000 people in the worst conceivable situation. This can be done in 6 hours. And I'm only counting on half of the communications apparatus," he said.

"Today there are 8300 private passenger cars in the county. I have left out 30 percent of these and estimated three people in each car.

"We also have 390 buses that can carry 45 passengers. We would use half of them. And then there are ambulances.

"But," he added, "doctors in Oskarshamn said they will need 6 hours. They may be performing operations, there are people in respirators, some patients are about to die.

"But when they're ready we will drive up in covered trucks of the moving van type. They can easily take 20 patients along with their beds and intravenous equipment.

"Within 8 hours we can empty the entire area. We'll move people northwest. To Vimmerby, Hogsby and Hultsfred. The sick people will be taken to hospitals in Vastervik, Vimmerby and Malilla.

"This is based on the assumption that everyone has been informed, has been alerted and follows instructions.

"Hospital personnel might leave their posts to save themselves if they have not been instructed in advance. And the phone company can't handle the load if people start calling up to find out what to do. During the blizzard in Monstera' last year the telephone network was tied up for several hours.

"If a core meltdown occurred today it would take at least 20 hours before we could rescue people. That is to say if the public follows the instructions issued by the authorities. But it could be quite confused."

But even with good organization people will not be evacuated before the radioactive cloud has passed by, Per Fredriksson revealed.

"It is low-level winds that will direct the cloud and the SMHI [expansion unknown] predictions are based on upper-level winds. We don't know which way the wind will blow and of course it can shift.

"Those living at least 15 km away from the nuclear plant must wait. Staying indoors provides 33 percent protection.

"But those living within 15 km of the nuclear plant will be evacuated immediately. The lung doses can be so high there that it would be better to evacuate in the wrong direction than to allow people to stay there."

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CD OFFICIAL CLAIMS GAS MASKS AVAILABLE FOR ONLY HALF POPULATION

Stockholm DAGENS NYHETER in Swedish 29 Feb 80 p 30

[Article by Hans Kronbrink]

[Text] If Sweden is exposed to an unconventional war involving ABC [nuclear-biological-chemical] weapons half the population will have to fend for themselves without the only guarantee of survival, a gas mask.

"It's a nightmare situation. Who will get gas masks and who won't? Our goal must be a mask for everyone in Sweden," says Folke Klefbom, defense expert with the Civil Defense Agency.

Our own government and parliament have agreed on this low number of gas masks despite the fact that they represent the only useful protection in an unconventional war.

Today approximately 3 million masks are stored at mobilization depots around the country. Each year 300,000 new masks are produced but this is not enough.

"It means that we will never have enough masks for all the people in Sweden. When we reach 6 million we must start throwing out the oldest masks as they become unusable," said Folke Klefbom.

Around the world more and more countries have seen the risks of an unconventional war and have supplied themselves accordingly.

"The eastern nations, for example, have put a lot into advanced ABC protection while here in Sweden we have considered the risk of such a war to be very small," Folke Klefbom pointed out.

Big Risks

The same type of thinking permeates a report by the current Defense Committee called "Our Security Policy" which has been sent to defense agencies for their consideration.

"We're very critical of the report in the Civil Defense Agency. We see the risks of a future unconventional war as being much more serious," Klefbom said.

"We also have around 500 plants involved in the Swedish chemical industry. If these are bombed very poisonous gases could leak out and kill large groups of people," Folke Klefbom said.

"I feel that at least the people living close to such industries should have access to gas masks that could also be used in peacetime. But nothing like this has been included in the report.

"In my view these problems are just as important as security problems concerning our nuclear power plants," said Folke Klefbom.

People living near chemical industries are not even included in the priority groups that would be the first to receive gas masks if war breaks out, according to the instructions issued.

"Included here are children under 17, employees at vital war industries and others without access to shelters with gas filters.

Theories on Paper

Most of the shelters are located in urban areas. This means that people in rural areas account for a large share of the available masks.

"But these are just theories on paper. What happens in reality when an ABC war comes about and we stand there with not enough gas masks? Who gets one and who doesn't? These are scary questions," according to Folke Klefbom.

ABC weapons are a comprehensive category including nuclear weapons and biological and chemical warfare. Biological weapons are substances that spread disease. Chemical warfare is waged primarily with gases that attack the nervous system and the breathing apparatus.

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NUCLEAR INSPECTION AGENCY URGES IMPROVED ACCIDENT PLANS

Stockholm DAGENS NYHETER in Swedish 6 Mar 80 p 8

[Text] The Nuclear Inspectorate (SKI) feels that preparations for nuclear accidents should be improved.

"Big nuclear accidents come under the category of national catastrophes and this would require the Swedish government to assume responsibility for rescue efforts," the SKI board said.

But SKI stressed that the safety efforts being made now will reduce the risk of accidents. This means the analysis of risk factors should be revised.

With reference to the report from the Radiation Protection Institute, "More Effective Preparedness," SKI will build up a separate emergency organization. Special alert groups would be sent out to affected nuclear power plants by helicopter. Each nuclear plant would require one of these groups containing six experts.

The alert group proposal is based on experiences from the Harrisburg accident. The government and parliament must appropriate enough funds if SKI is to be able to set up such groups. It would then take from 1 to 2 years before the SKI emergency organization can go into operation.

A similar special alert force has been a fixture for several years now at Studsvik Energy Technology (formerly Atomic Energy).

SKI agrees with the Radiation Protection Institute that even a threatening situation in a reactor should lead to intervention by the proper authorities. The SKI alert groups would start working at a very early stage, preferably whenever there is a threatening situation that could lead to radioactive emissions.

As a step in its effort to improve safety SKI will soon make a proposal to the government on supplying nuclear power plants with so-called filter chambers. The idea is that radioactive steam or water could be filtered in these chambers prior to emission. Research is being done at Studsvik into filter chambers.

SKI is also studying efforts by the nuclear power industry itself to improve safety. In addition they are reviewing the many reports on the Harrisburg accident.

The safety improvement measures SKI will be presenting will be "implemented in the 1980's if the government and parliament come up with the money needed," SKI told PRESS WIRE SERVICE, INC.

"If the proposals are implemented safety will be that much better and the old risk analyses will have to be revised," said the SKI board. Among other things they mentioned that current research into vapor explosions could change the picture of this type of accident.

The Rasmussen report indicated that a vapor explosion could split both the reactor tank and its container. Early reports from this research suggest that this would not occur, the SKI board's statement said.

The board did not agree on the SKI reply to the Radiation Protection Institute's report, "More Effective Preparedness."

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PROFESSOR ATTACKS OFFICIAL REPORT ON POSSIBLE NUCLEAR DISASTER

Stockholm SVENSKA DAGBLADET in Swedish 4 Mar 80 p 5

[Article by Hans Rehnvall]

[Text] The worst reactor catastrophe on which the reports of the Radiation Protection Institute are based, involving thousands of fatalities and tens of thousands of illness cases cannot occur.

"Naturally that is a joyful prospect, but we only found out about it a few days ago--and then our report had already been published," they said at the institute.

The report by the Radiation Protection Institute (SSI), which gained widespread attention before the popular referendum, deals with what could happen in the vicinity of a hypothetical reactor accident.

Special attention was given to the "worst conceivable accident"--one in which the reactor core melts causing a vapor explosion that blows apart both the reactor tank and the reactor enclosure (the meter-thick cement building surrounding the reactor).

It is this vapor explosion that now appears to be totally unrealistic. Quite simply there wouldn't be any explosion.

"SSI was basing this on theories from 1974 which were reported in the so-called Rasmussen report," said Kurt Becker, professor of reactor technology at the Technical College.

Experiment With Uranium

"At that time small experiments had been conducted with melted uranium fuel--this involved up to 15 grams of melted metal placed in water. The core of a reactor weighs hundreds of tons!

"In recent years experiments with larger quantities of molten uranium fuel have been made. Up to 27 kg of the molten metal oxide (around 2000 degrees hot) have been poured into a water-filled steel storage space representing the reactor tank. And entirely different results have been obtained."

A vapor explosion assumes that the molten fuel comes in contact with water very quickly and immediately disperses in small drops before much cooling has occurred.

Not before this fragmentation occurs, thus greatly increasing the surface of the molten fuel would the energy be transferred from the fuel to the water. This would be so rapid--a fraction of a second--that the vapor would explode. The reactor tank would crack, the lid would be blown off and crush the thick reactor enclosure--and radioactivity would escape.

Reactor Would Remain Intact

It has now been shown that the molten metal would not divide up into small drops. In reality the transfer of energy from the molten metal to the water would occur slowly--all indications are that the greater the quantities of metal involved the more slowly this would occur--and there simply would not be any vapor explosion. The reactor would not fall apart.

"It is too bad that SSI doesn't follow up on new research when it writes this kind of report," Professor Becker said.

"These are obviously new results but even so SSI could have asked if anything new had been discovered since 1974."

Professor Becker wrote to the Ministry of Agriculture (under which SSI comes) concerning this matter:

"The report should be returned to SSI for revision and with a request that an analysis be made of the consequences of accidents that could occur."

At SSI Dr Jan Olof Snihs, head of the nuclearphysics division, said it is not strange that they used old assumptions--they did not know that new results had come out.

Wide Coverage

"We heard about it a few days ago at a meeting at SKI [Swedish Nuclear Power Inspectorate]," he told SVENSKA DAGBLADET. "The SSI report was already out then and had been given wide coverage in the mass media.

"It's really great that the worst possible accident can be eliminated from the discussion."

SKI chief Lars Nordstrom told SVENSKA DAGBLADET that the new results have not yet been presented to the board.

"We are constantly learning more about various hypothetical events. The fact that the worst catastrophe can now be eliminated does not mean that all the problems have been solved."

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GEOLOGISTS REPORT BARSEBACK LIES IN EARTHQUAKE ZONE

Stockholm SVENSKA DAGBLADET in Swedish 12 Mar 80 p 7

[Article by Vera Brodin]

[Text] The nuclear power plant in Barseback is not just located in a densely-populated area. It is also located on a geologically sensitive site where earthquakes can occur. The nuclear plant could not have been located there if we in Sweden had had the same regulations concerning the location of atomic power plants as they do in the United States.

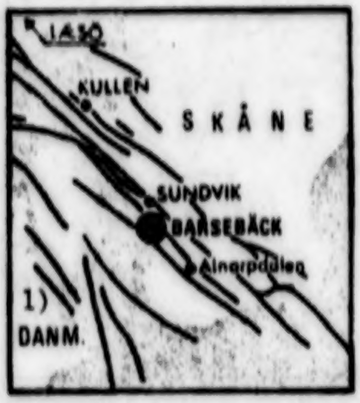
There are some indications that there is a risk of earthquakes on the Barseback site. As recently as 1930 a fairly strong tremor was registered in the immediate vicinity of Barseback. There is a 10 percent risk that the Barseback plant could be hit by an earthquake during the 30 years it is expected to be in operation.

This claim was made in a joint statement issued by four geologists, Claus Heinberg, Holger Lycke Andersen and Jens Morten Hansen from Denmark and principal state geologist Bertil Ringberg of Lund.

Earthquakes are not common in Scandinavia. But they do occur from time to time. But was any consideration made of earthquake risk when Barseback was being planned, the four geologists wondered.

From a geological point of view there are great differences between Denmark and Sweden. The Swedish bedrock consists mainly of granite and gneiss with only a thin sedimentary crust on top. In many places the bedrock is completely exposed, for example in the Goteborg archipelago. It is quite different in Denmark. The bedrock there is deep below the surface with many sedimentary strata on top.

The differences occurred during a period of several hundred million years, when Sweden became elevated and Denmark sank. Tension developed between the areas, leading to earthquakes and subsequent faults.



This shows how the fault lines run along the Fennoscandian peripheral zone.

Key:

1. Denmark

Serious Matter

In a very narrow zone in a northwest-southeast direction from northern Denmark to Bornholm, the Fennoscandian peripheral zone, there are many of these faults. On the Swedish side they can be found in such places as Sundvik, north of Landskrona, and Kullen.

The Barseback plant is situated on a fault line along the so-called Alnarp depression. But this was not included in the safety evaluations of Barseback and that is a serious matter. Therefore the four geologists believe it is important to study how much earthquake activity there has been in modern times and whether the zone is still alive.

The four geologists would not speculate on what an earthquake might mean for the operation of an atomic power plant. But the water cooling system could conceivably be put out of action, resulting in a core meltdown.

Permission

What would happen to the ground water? In this region it is artesian, meaning that it is kept down by dense layers of earth. What would happen if the pressure decreased?

The facts known about the Fennoscandian peripheral zone would have been sufficient to rule Barseback out as the site of a nuclear power plant if Sweden had the same regulations as the United States with regard to the location of nuclear plants, the geologists said. They also pointed out that no fewer than five American nuclear power plants have been shut down for geological reasons less serious than those in existence here.

The head of the technical unit at the Nuclear Power Inspectorate, Tore Nilsson, said the application for permission to operate the Barseback plant was made in 1968.

Eight Earthquakes

"The bearing capacity of the earth and the composition of the soil were studied then. There is a seismological report from SGU (Swedish Geological Survey). According to SGU eight earthquakes have occurred in the period 1891-1950.

"Tremors in this country are relatively minor. But even so we feel this earthquake issue should be reviewed. There is no danger to the buildings, since they have the proper dimensions. But instruments might be damaged. We have started a research program in this area. FOA (Defense Research Institute) is now studying earthquake intensity and the risk at all nuclear power plants, both the old ones and those that are planned for the future," Nilsson said.

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WORLDWIDE SERIAL REPORTS

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WORLDWIDE REPORT: Epidemiology
WORLDWIDE REPORT: Law of the Sea
WORLDWIDE REPORT: Nuclear Development and Proliferation
WORLDWIDE REPORT: Telecommunications Policy, Research and Development

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